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# Electronic Age

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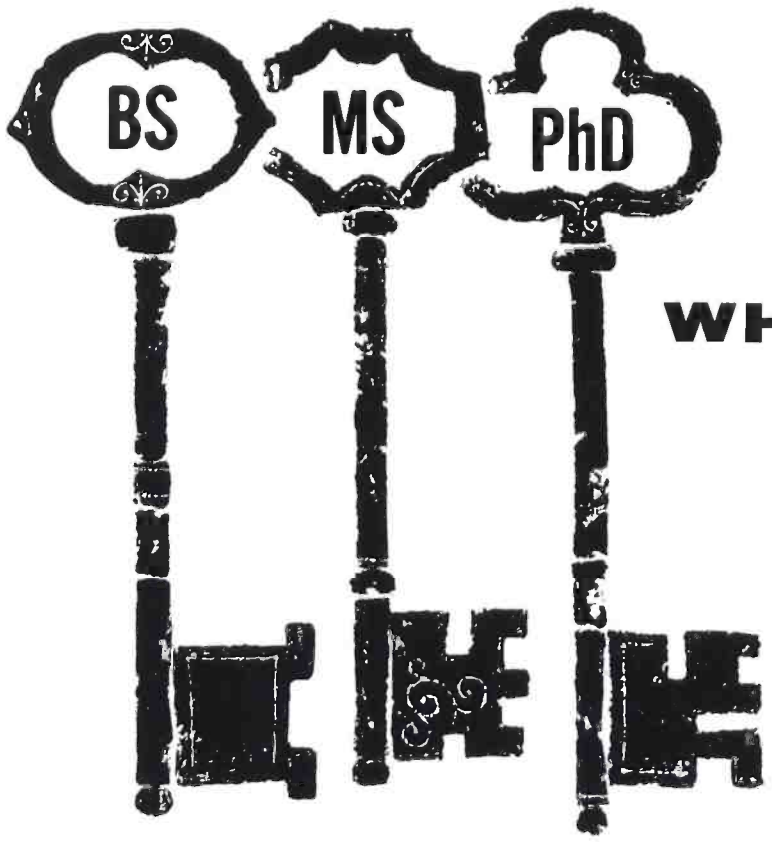


# WHICH DOOR WILL YOU OPEN AT RCA?

Good question! Possibly you have your answer. But more probably you could use some aid and advice in deciding just what kind of work you want in exactly what engineering field. Or maybe you have graduate work in mind, but aren't quite sure how you can swing more years in school. Engineering management at RCA has given years of thought to your problem. The plans they've come up with have helped many engineering and science graduates to achieve rewarding, satisfying positions. Here's a brief outline of RCA opportunities open to you:

## DESIGN AND DEVELOPMENT PROGRAM

You will receive technical assignments that give you a realistic understanding of RCA operations and opportunities. These assignments are developed to your interests and insure a comprehensive coverage of RCA engineering activities. From your very first day of training, you're a professional engineer in both status and salary. RCA's advancement programs also work in your favor, just as they do after you finally take over full professional responsibility. Design and development assignments may be in military or commercial electronics.

## GRADUATE STUDY

Earn your MS in EE, ME or Physics . . . as RCA bears the full cost of tuition, fees, approved texts and materials. While on this program you carry approximately half a full academic schedule. You're eligible for all RCA benefits and merit increases. In two years or less, you'll receive your degree. You study at the University of Pennsylvania if you choose engineering work in military or commercial design and development. On an Electron Tube or Semi-conductor assignment, you attend Rutgers University.

## DIRECT ASSIGNMENT

Possibly you are sure of the engineering direction you want to take. With experience and education that meet RCA's requirements, you'll find dozens of opportunities for direct assignments in many RCA engineering fields. Get the story . . . then decide.

See your placement officer about getting together with an RCA representative, and to receive detailed brochures on RCA plans for your future. If you are tied up when RCA's representative is on campus, send a resume to:

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**College Relations, Dept. CR-000**
**Radio Corporation of America**
**Camden 2, New Jersey**

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**RADIO CORPORATION of AMERICA**

JULY 1958
VOLUME 17
NUMBER 3

# Electronic Age

RESEARCH · MANUFACTURING · COMMUNICATIONS · BROADCASTING · TELEVISION

COVER

President Dwight D. Eisenhower, dedicating the new $4 million NBC Radio-TV Center in Washington on May 22, said: *I cannot fail to congratulate, to felicitate the National Broadcasting Company for this particular step in developing the communications industry of our country.*

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NOTICE

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# NEW REALMS

## FOR HOME ENTERTAINMENT

### RCA Victor 1958-'59 Product Lines Spotlighted in Introductory Showings

IN JUNE, the Radio Corporation of America turned the spotlight on vast new realms for home entertainment. Showings to the press and distributors in New York, Chicago and Los Angeles revealed the most impressive product lines in RCA's history.

Leading the parade of new public enjoyment was a complete line of instruments and accessories designed to bring stereophonic music into the home for the first time at mass-market prices. Another outstanding feature was RCA Victor's new black-and-white and color television receivers to be known as the "10 Million Line," in recognition of the fact that the Corporation's ten millionth TV set will be produced this fall. The new products, which were enthusiastically received at their unveilings, will soon be rolling off assembly lines.

Stereophonic sound has long been known to specialists in the field as the most exciting and authentic form of high fidelity music reproduction. It has previously been achieved, however, only through costly custom-built equipment. Now for the first time RCA Victor is offering a complete line of stereo tape and disk players to fit all budgets. The nationally advertised

Recorded with a multiple microphone setup, stereo recordings give depth, realism and direction to sound, just as in a concert hall.

prices for the new stereo hi-fi "Victrolas" will range from $129.95 for the lowest-priced portable to $2,500 for the three-cabinet Mark I, which is a complete sound center with record turntable, tape-cartridge player, tape recorder, AM and FM radio, and two additional sound units. As part of the line there will be seven auxiliary speaker cabinets ranging in price from $9.95 to $125.95.

Stereophonic music was demonstrated at the recent meetings on revolutionary new two-channel disks priced only slightly higher than ordinary single-channel records. It was also heard on stereo tapes in plastic loading magazines as easy to play as disk records. The new record-playing phonographs will accommodate ordinary single-channel records as well as the new stereo disks — which means that valuable record collections amassed over the years will not become obsolete. There is also a player which accepts both the stereo tape and the stereo record.

The new method of music-making, demonstrated at the various meetings, depends on a system of multiple microphones in the recording studio, and is played back through two or more cabinet speakers in different corners of the living room. The result is an astonishing effect

RCA's new portable receivers showed excellent picture reception in the new Boeing 707 jet airliner flying 600 mph, at 35,000 feet, over 180 miles from the transmitting station.

of "presence" which must be heard to be believed. The music envelops the listener, just as it does in the concert hall or theater. The various sections of an orchestra are heard in all their distinction and clarity — a kind of "music in the round."

Fifty-five stereophonic records are now ready for release by RCA Victor Records Division, including seventeen of classical music. Others will follow on a regular basis. The first thirty-two stereo-tape cartridges are also on the way. These handy packets — plastic magazines seven inches long, five inches wide, and half an inch thick — contain up to an hour of pre-recorded stereophonic music. They can be inserted and removed from the player without touching the tape.

### Television Achievement

RCA Victor leadership in black-and-white and color television will be dramatized in the fall by the manufacture of the ten millionth RCA Victor TV receiver. To commemorate the event — a production record for the industry — six new models in the 1958-59 line have been designated as the "Achievement Series." Each contains outstanding new features. These receivers are the nucleus of the entire RCA collection of twenty-six black-and-white TV receivers and six color sets, recently demonstrated as the "10 Million Line."

A highlight of the new line is the "Wireless Wizard" remote control unit, which operates all controls on a TV set from anywhere in the room. This is the third of six major developments which President John L. Burns has said that RCA Victor would announce during

The Hillsdale console black and white receiver features a swivel base and a new stereo jack that plugs into "Victrola" stereophonic sound player.

the year. The first two were the stereo tape cartridge and the stereo disk and tape players.

The Wireless Wizard for color TV is the product of several years of RCA research. Buttons on the remote control unit turn the color receiver on or off, change channels, adjust tint, color controls, and volume, and even lock in fine tuning automatically.

The Wizard operates by sending ultrasonic signals, high above the range of audible sound, across the room to a receiving device in the set. These signals are amplified to actuate relays which adjust the controls on the receiver. No outside sounds — such as the whine of a jet plane overhead — will interfere with the operation. The development of a wireless remote control for color sets was hailed as dramatic proof that today's color television receivers are stable, highly reliable instruments.

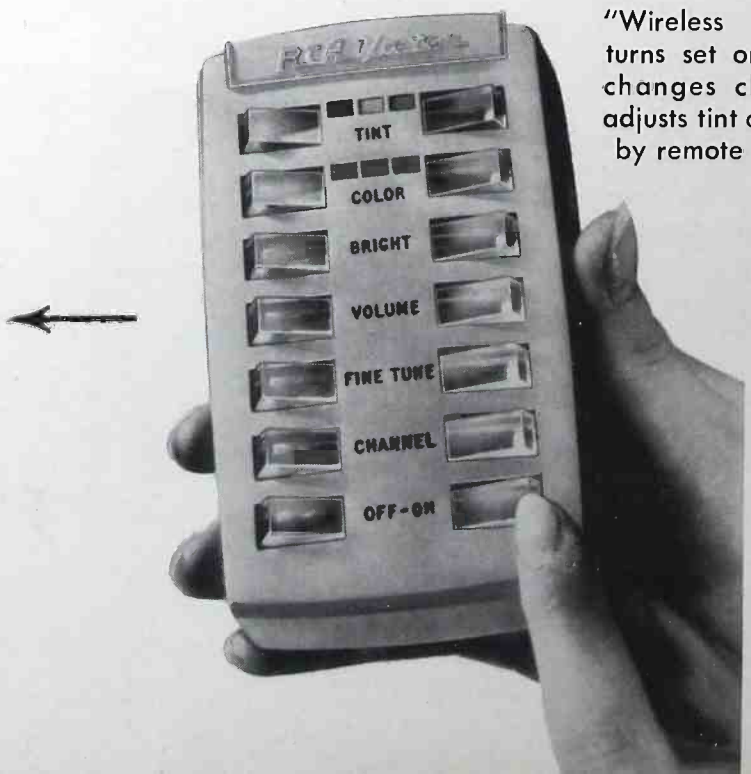
Besides Wireless Wizard for color, which operates all controls on the set, RCA engineers have developed a second Wizard for both color and black-and-white receivers. It turns the set on or off, changes channels, and adjusts volume from anywhere in the room. This control is available at no extra cost on two new color models and three black-and-white models.

Also at no extra cost to the buyer, a special 90-day labor and parts warranty will be offered on the full RCA Victor line by most dealers. In addition, RCA is extending the factory parts and tubes warranty on all new color television receivers from the traditional 90 days to one full year. These innovations reflect the confidence of dealers, distributors, and the factory in the quality and performance of RCA Victor television. It is a result of the experience gained in manufacturing ten million TV receivers.

Other features of the new line include:

*"One-set" electronic fine tuning.* The first time the receiver is tuned, fine tuning for each VHF channel is set. No further fine tuning is needed.

The Worthington color receiver offers complete tuning control from any point in room with "Wireless Wizard" Electronic Remote Control.




"Wireless Wizard" turns set on or off, changes channels, adjusts tint and color by remote control.

*Ten per cent brighter picture,* on all models with 21-inch picture tubes.

*Clock and automatic TV timer,* built into the set, automatically turns it on and off at predetermined times.

*Stereo jacks.* A number of models have built-in stereo jacks that let the TV set double as a stereophonic speaker unit.

The remarkable power and performance of the new RCA Victor line was demonstrated recently when a portable 17-inch television receiver was flown aloft in a Boeing 707 jet airliner. At 600 miles per hour and a 35,000-foot altitude, the set produced excellent pictures up to 183 miles from the nearest station.

RCA Victor also made news last month with a number of improved, high-performance transistor radios. Two of the new portables, "Transicharg Super" and "Transicharg Deluxe," are designed to play at least five years on a single rechargeable battery. Special rechargers have been developed which transform the portables into AC models while the batteries are being juiced up.

In addition to these new models, an all-transistor cordless table radio is now ready for production. Called the "Starliner," it operates on seven RCA transistors and one crystal diode, and will play twenty hours a week for one-and-a-half years on a single battery pack.

One of the most powerful new portables ever to be developed by RCA Victor was introduced as "Strato-World III." This little giant operates on seven bands — standard AM, two ship-to-shore and amateur short-wave bands, plus four international short-wave bands. It operates on nine flashlight batteries.

### The "Achievement Series"

*The Barton* — a table model with front-tuning, easily adaptable as a "built-in," with "One-Set" electronic VHF fine tuning, nationally advertised at $199.95 in ebony, $219.95 in mahogany, oak or walnut grained finishes.

*The Wayne* — a modern console with many deluxe features, nationally advertised at $249.95 in walnut, $259.95 in mahogany and oak grained finishes.

*The Hillsdale* — a swivel console with three speakers and deluxe chassis, tone control, stereo and phono jacks and lighted tuning controls, cabinet featuring a choice of walnut-grained finish, nationally advertised at $299.95, and mahogany, limed oak or birch finishes at $315.00.

*The Lambert*—a lowboy console with "Wire less Wizard" remote control, three speakers and "One-Set" electronic VHF fine tuning, nationally advertised at $379.95 in walnut grain, and $389.95 in mahogany and oak finishes.

*The Kentwood* — a deluxe lowboy with wood cabinet, three speakers, lighted "Front Window" channel indicator, stereo and phono jacks featuring genuine hand-rubbed mahogany, walnut or oak cabinets, nationally advertised at $369.95.

*The Southbridge* — a lowboy color set with lighted controls on front of cabinet, three speakers, nationally advertised at $695.

Stereophonic tape in plastic cartridges contains up to an hour of music on tape; the cartridges are inserted in player as easily as phonograph record.

RCA Victor's Stereo-Orthophonic Mark XII offers several auxiliary speaker systems. It is available in mahogany and is advertised at $149.95.

# RCA's ROLE in Tracking Missiles

by Robert L. Moora

TRACKING missiles from the Air Force Missile Test Center at Cape Canaveral, Florida, represents one of the biggest and most important electronic projects in the Free World today. It is a vital factor in America's conquest of space.

The project provides not only information essential to split-second direction of missiles being test-fired from Cape Canaveral but also to the successful orbiting of satellites launched by the United States. Moreover, it supplies information about missile and satellite performance necessary to future development of such vehicles by the contractors building them.

This project is being operated by the Radio Corporation of America, through the RCA Service Company, as sub-contractor in the technical fields to Pan American World Airways, Inc., the prime contractor for the Air Force in operating the Missile Test Center.

## Highly Trained RCA Personnel

On duty in this test project are more than 2,800 highly trained personnel of the RCA Service Company. Some handle the massive yet delicate installations at Cape Canaveral. Others are at work on the development and refinement of electronic equipment in the various shops of the Technical Laboratory at Patrick Air Force Base fourteen miles south of Canaveral. Still others—around 500 men—are manning bases on lonely islands and on ships at sea all the way down the 5,000-mile range to Ascension Island, halfway between the coasts of Brazil and Africa.

## The Tracking Operation

The RCA Service Company has responsibility for the all-important technical aspects of range operation — the planning, engineering, installing, maintaining and operating of the electronic and optical equipment used in the missile tracking. This includes, besides the Canaveral and Patrick installation, the down-range chain of stations, composed of eleven island bases and eleven ships, former military vessels now equipped with electronic devices for tracking.

From the beginning of the countdown through the completion of the flight, whether to the target or into orbit in space, the data from the complex RCA-operated

installations guide the men directing the operation. And later, on film, on magnetic tape, on paper tape, on punched cards, on pen recordings and on plain paper, the complete data about the missile's performance is provided for guidance in future missile development.

The information comes from three general sources—radar, telemetry and optical instruments. But there are still other sources: Missiles that are recovered by landing on the skid strip at Cape Canaveral have on board recorders which provide much more data than the telemetry units. Also, data-recording instruments now are in use that detach themselves from high-speed missiles before impact for recovery by parachute and flotation gear. And, finally, "chase photographers" in jet planes frequently take pictures of the vehicles in flight.

Radar provides the principal flow of information on which the missile control operators work.

Telemetry is the comparatively new electronic magic of determining from a radio signal from a remote point what is taking place at the source of the signal. This is done by means of transducers, instruments which are pre-arranged to react to specific circumstances—acceleration, temperatures, etc.—and translate information into radio signals that bring it back to the people concerned. Most missiles carry at least four telemetry links—some more than that—providing as many as 400 or 500 separate pieces of information.

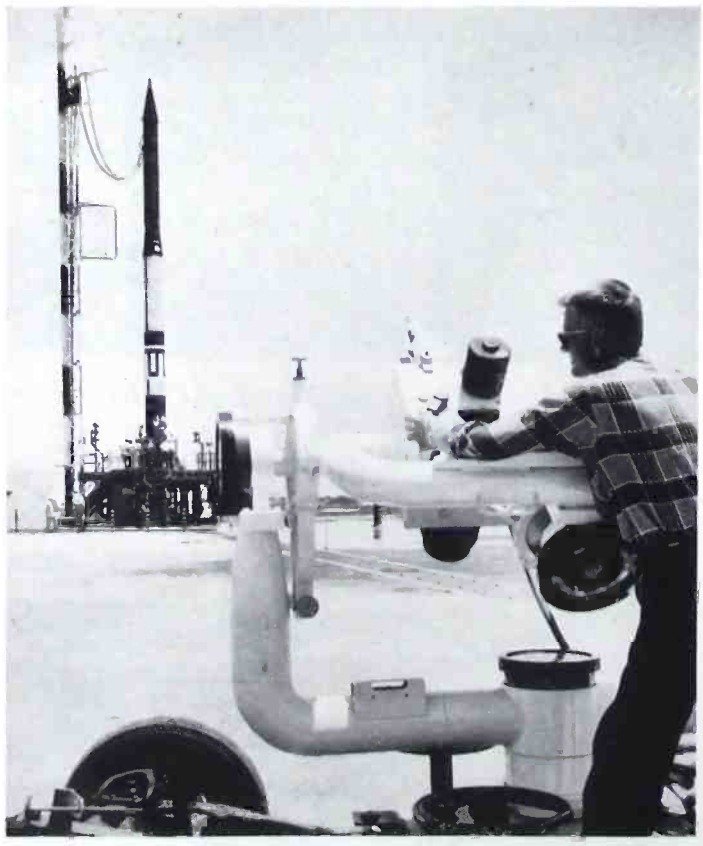
The most precise information on a missile in flight is provided by cameras—some of them tracking cameras, some fixed or stationary cameras. In an average missile launching, about thirty fixed cameras are in the immediate area of the firing, each trained on a certain portion of the flight path, to photograph the first 3,000 feet of flight and provide pictures for subsequent analysis of

T-MINUS 1—During the countdown, technicians sit tensed for action in front of their apparatus in a blockhouse 200 yards from the launching pad. The vital communications system between the Central Control Building and down-range points are maintained by RCA Service Company personnel. Four TV monitors provide different views of the missile shoot.

T-MINUS 2—The tension becomes almost unbearable in the last moments. Technicians view the events on the pad through television monitors.

T-MINUS 3—In the blockhouse, an engineer, his eyes glued to a periscope, reports to Central Control during final seconds of countdown.

SHE'S OFF!—Relief is evident on the faces of the technicians as the missile roars upward, in an apparently successful shoot. Telemetry instruments inside the "bird" and radars and cameras manned by RCA Service Company personnel take over the job of collecting information on the rocket's performance.



A camera near the launching pad is preset by RCA Service Company technicians to record the missile's takeoff.

such things as the exhaust flame and behavior of the missile's exterior components. Accurate pictures in this early stage are particularly important because other electronic devices sometimes are confused at low altitudes by "ground clutter"—signals bouncing off the ground and becoming confused with other signals.

These cameras, some of them installed within twelve feet of the launching pad, are set in motion automatically by the RCA sequencing equipment inside the blockhouse. Some of them can operate at a speed of 6,400 frames a second, providing extremely slow-motion playback for the benefit of the engineers.

Much of the precision tracking and positioning is accomplished by continuous-wave systems. The Dovap System (Doppler Velocity and Position) is one of the most important and useful. Dovap is a continuous-wave system utilizing the basic Doppler principle of determining the speed of an object's movement by measuring the apparent change in the volume of its sound—or the frequency of its signals—as heard at a stationary point.

## RCA Communications System

Both on the Cape and down-range, the RCA-operated communications system is an integral part not only of the tracking but of the whole AFMTC operation. The communications system ranges from a telephone network (red phones for emergencies such as "destruct," green phones for missile functions and for security, black phones for other purposes) to a complex system for communicating digital data and the all-essential timing signals.

Accuracy of timing is extremely important in synchronizing the functions of the missile and the operations of the tracking instruments. In each blockhouse, RCA operates a "firing sequencer." This is a piece of electronic equipment which automatically controls many functions in the missile itself, checks the countdown, holds the count if certain missile functions are delayed, activates the fixed cameras at the proper time, and performs numerous other vital duties.

Accurate time signals are obtained at frequent intervals from the Bureau of Standards in Washington. Thereupon the timing along the entire network from Canaveral to Ascension Island is synchronized to an accuracy of one-ten-millionth of a second.

Down-range, the life-line of communication is a submarine coaxial cable extending from the Cape to Puerto Rico, with drop-offs to the island bases and also to many unattended places where there is equipment that is serviced every three months. This cable, with multiple channels for voice, teletype and data transmission, permits the sending of radar data, real-time telem-

## KEY STATISTICS

Statistics illustrate the nature of the RCA tracking systems' performance:

- On the console in front of the Range Control Officer, instruments spell out the performance of a missile steadily as it hurtles through space — and ten times a second advise him exactly where it would fall if its power should be cut off instantly . . .
- One segment of the information flashing before him comes from a radar so accurate that from a distance of eighty-eight miles it could call "fair" or "foul" a baseball hit out of Yankee Stadium . . .
- Inside the missile itself, tiny transducers are sending back information of vital importance both to current operations and for the record — speed, temperature, altitude, etc. . . .
- Still other data are being recorded — in photographic form — through a new optical tracking instrument so precise it permitted the photographing of Sputnik II as it sailed through space more than 200 miles above the earth with sufficient clarity to determine its approximate length.
- On a single missile test, RCA men may record as much as 50,000 feet of film and 100,000 feet of magnetic tape, the data from which are then processed into 50-to-100 page reports for the Air Force to present to the missile contractor.

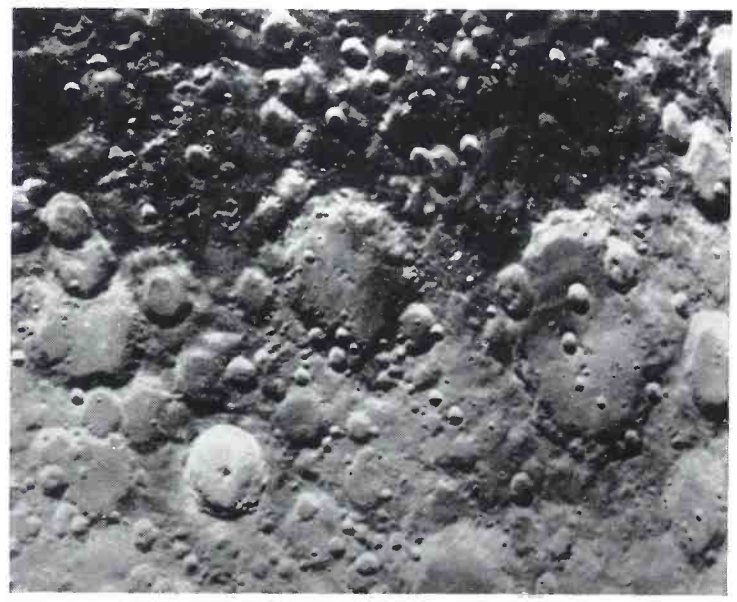
etry, command destruct functions, etc., as well as voice communication. Radio circuits supplement the cable.

The destination of the mass of data recorded during a missile's flight is RCA's huge data processing facility. Film and tape are rushed by air from all recording stations, and the raw data are fed into FLAC (Florida Automatic Computer) and other data translation equipment where they are correlated into usable information.

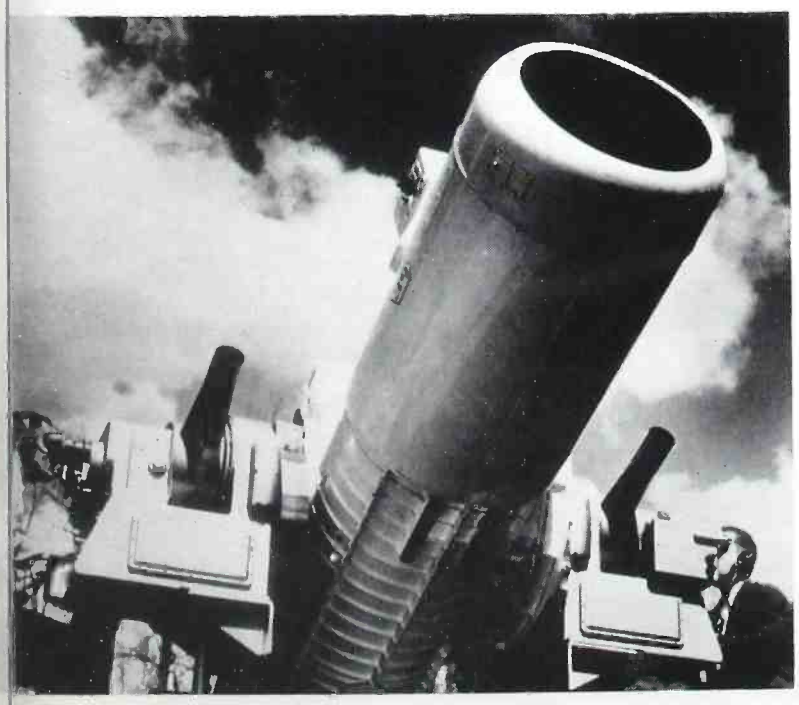
On a single missile test, RCA men record as much as 50,000 feet of film and 100,000 feet of magnetic tape. In the last six months (through March, 1958) RCA has processed an average of 375,000 feet of film a month and 30,000 still pictures a month.

The end result—processed data—provides the Air Force and the missile contractors with a priceless record of the missile's functions, from which any deviation from predicted operation may be pin-pointed.

Thus, through Missile Test Range instrumentation, the nation's scientists are obtaining the data they need to perfect the mighty weapons systems that will compose this nation's defense arsenal in years to come.

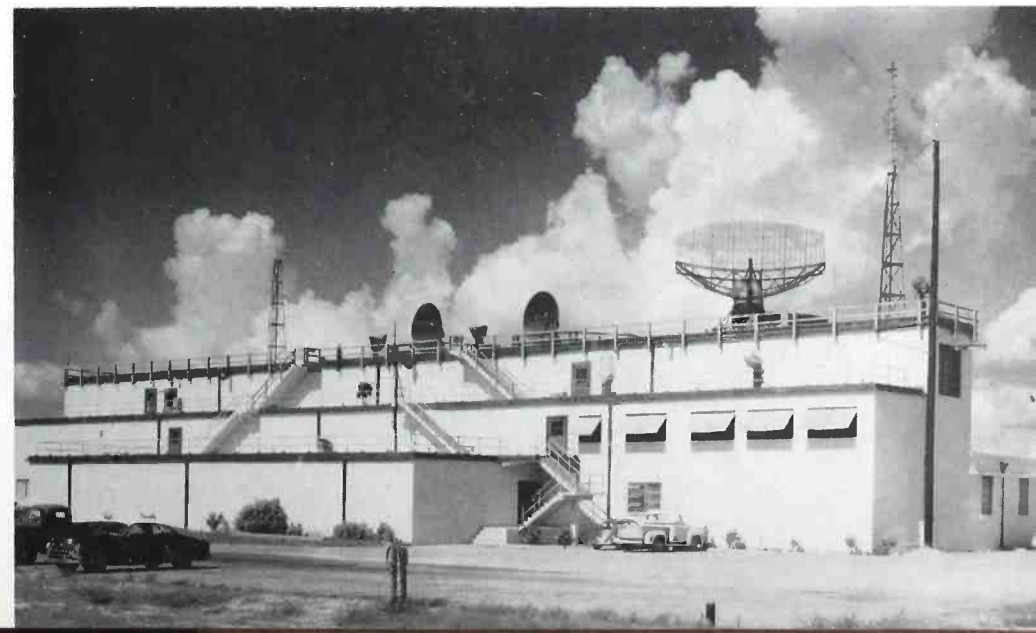


Craters on the moon are plainly visible in picture taken by ROTI camera from Melbourne Beach, Florida.



Manned by RCA Service Company personnel, a giant ROTI (Recording Optical Tracking Instrument) on the beach fifteen miles south of the launching site, is aimed at the flight path. It can photograph missiles 100 miles away.

Central Control Building at Cape Canaveral is the nerve center of all communications during a shoot.



More than 1,200 shareholders attended the RCA Annual Meeting in an NBC studio in New York.

# TOWARD HIGHER VOLUME and PROFITS

## *Three-point program of RCA announced at 39th Annual Meeting of Shareholders*

RCA has embarked on a three-point program to "sell our way to higher volume and higher profits," John L. Burns, President, told shareholders at the Corporation's 39th Annual meeting held in a studio of the National Broadcasting Company on May 6.

Mr. Burns said the program calls for, (1) expansion of some existing activities, (2) creation of new departments including one to produce satellites, space vehicles and associated electronic equipment, and (3) the introduction of six important new products, beginning with a tape cartridge for home music reproduction. Brig. General David Sarnoff, Chairman of the Board, presided at the meeting.

During the first quarter of 1958, Mr. Burns said, sales of RCA products and services amounted to $278,339,000, compared to $295,773,000 for 1957.

Profits before Federal income taxes amounted to $18,008,000, compared to $25,541,000 for 1957.

Earnings per common share were 59 cents, compared to 87 cents for 1957.

"Our plans," said Mr. Burns, "contemplate our business for the full year 1958 running ahead of the rate for the first three months, and we hope that economic conditions for the nation as a whole will so develop that we will be able to carry out these plans."

As the first of six important new products which RCA will put on the market this year, Mr. Burns announced a high-fidelity tape cartridge for home music player-recorders. The first of its kind to be commercially developed, the new cartridge holds enough tape to provide two hours of regular music or one hour of stereophonic music.

The RCA President disclosed that the company has established seven new major units, and he described as "perhaps the most significant" the new Astro-Electronic Products Division.

"This Division has been set up to develop and produce earth satellites, space vehicles and their associated electronic equipment," said Mr. Burns. "It is the first unit of its scope and purpose to be established by any electronics company."

In the area of existing facilities, Mr. Burns pointed out that NBC registered dramatic and important advances in the broadcasting field. Network billings reached a new high. NBC became the Number One television network during the peak hours of nighttime programming. The NBC radio network became Number One in terms of sponsored hours. Color television programs broadcast over NBC increased substantially.

NBC's share of the national television audience has increased tremendously this broadcast season, and the latest audience survey shows NBC leading the second network by 14 per cent in average evening ratings, and the third network by 39 per cent.

Color television continues to advance not only in programming but also in merchandising. Sales of color sets to consumers are running well ahead of last year.

One of the most promising fields of future growth — and one in which RCA already has an expanding stake — is automation in business and industry. A new highly adaptable computing system is being placed on the market by RCA. It includes advanced features developed through RCA research.

On the new frontier of *missilonics,* RCA is expanding and intensifying its activities in research, development, production and service.

For the first quarter, new Government orders have increased by $130,000,000 over the same period in 1957. For the full year, RCA expects to be about 10 per cent ahead of 1957 when the Government sales ran $267,000,000 — accounting for 23 per cent of total business.

"As a nation, however, we must not settle for mere stability," Mr. Burns said. "The key to America's high standard of living has been its ability to move ahead at an ever quickening pace — in employment, in productivity, in national output. Today, no less than in the past, we must step up our productivity, cut our costs of doing business, increase our rate of sales. It is not enough for us to sit back and wait for the recession to end all by itself. We must take positive steps to bring about this end."

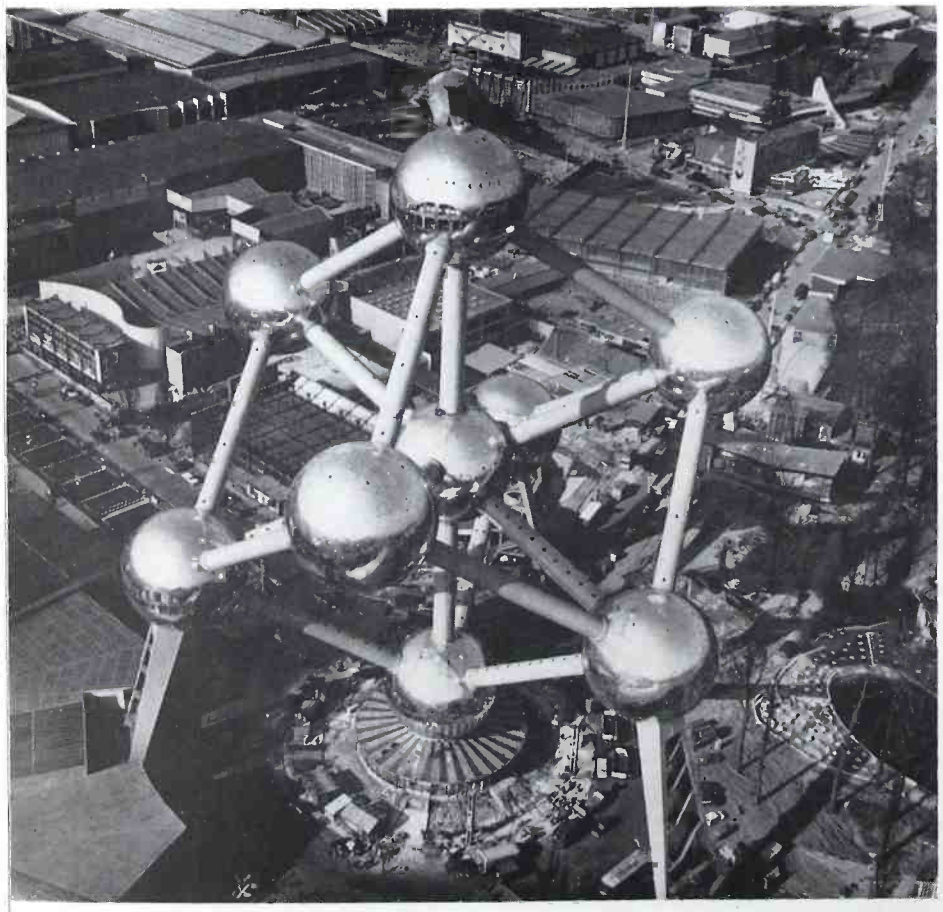
Mrs. Louisa Josephine Newkirk, 91 years old, attended the meeting and has been an RCA shareholder for many years.

Mr. Burns, shows shareholders laboratory model of fountain-pen-size-radio and high-fidelity tape cartridge for home music players; General Sarnoff displays Telemite camera.

# color TV

## AT THE WORLD'S FAIR

U. S. Pavilion at the Brussels World's Fair.



TWENTY million Europeans are getting their first look at color television this summer at the Brussels World's Fair 1958.

That is the estimated number of visitors expected to view transmissions over the closed-circuit RCA color TV system in the American Pavilion, the theme of which is "to give Fair visitors who have never been to the United States the feeling of the country, its land and its people, its science and technology, its institutions and its cultural interests."

The color television studio set up by RCA under contract to the U. S. State Department, is attracting thousands of visitors a day. The studio turns out eight hours of color programs daily, and visitors to the pavilion can see both the activities in the studio and the finished product in the form of programs on RCA color receivers placed about the exhibit. The programs are produced by an NBC production team, headed by Program Director Jack Crutcher and Producer John Schwartz.

The Fair's symbol, the Atomium, represents atomic structure of an iron crystal magnified 150 billion times.

A second major RCA contribution to the American Pavilion is a music room equipped with a "Victrola" hi-fi phonograph, a monaural tape recorder and stereophonic sound playback units, plus a library of over 1,000 popular and classical records.

There is also a minimum of twelve live programs every day, at least one in each hour. Cartoons, slides and film fill out the schedule, with the audience changing every 15 minutes. The talent is recruited from visiting performers from all parts of the world, from the various national pavilions, and from the U. S. pavilion.

On one of the first days of the Fair, Miss Europe was interviewed by NBC commentator Ben Grauer. The Hot Club of Belgium produced a guest of the club, American jazz pianist Hazel Scott, who did a show. Milton Caniff, creator of Terry and the Pirates and Steve Canyon, presented a cartoon demonstration. Elaine Malbin, Metropolitan Opera star, was recruited for a program. Producer Joshua Logan was interviewed. News programs are presented regularly in French as well as in English, with Belgian-born John Schwartz doing the French.

An international four-piece jazz outfit appears regularly. The pianist is from New Jersey, the guitarist is a Belgian, and the bass and drummer are Swiss. Another regular feature is an Indonesian band which plays excellent jazz as well as Latin-American music.

Folklore groups in native costumes add a colorful and international note. Recruited from the various national pavilions, they perform regularly before the RCA color camera.

A group of hostesses from the Japanese pavilion were interviewed, and showed how Japanese food is prepared and served.

The public viewing area, behind glass, can accommodate several hundred visitors at a time. The area is usually jammed during the live programming.

## TV Opera

In August, the NBC Opera Company will present the world premiere of a new opera by Gian-Carlo Menotti at the Pavilion. The opera, "Maria Golovin," which was commissioned by NBC, will be performed for two weeks at the Fair and will later be telecast over the NBC-TV network. Producer is Samuel Chotzinoff, General Music Director for NBC. The cast includes singers Franca Duval, Shirlee Emmons, Richard Cross, James Loomis, Patricia Neway, Ruth Kobart, Genia Las, Herbert Handt and William Chapman.

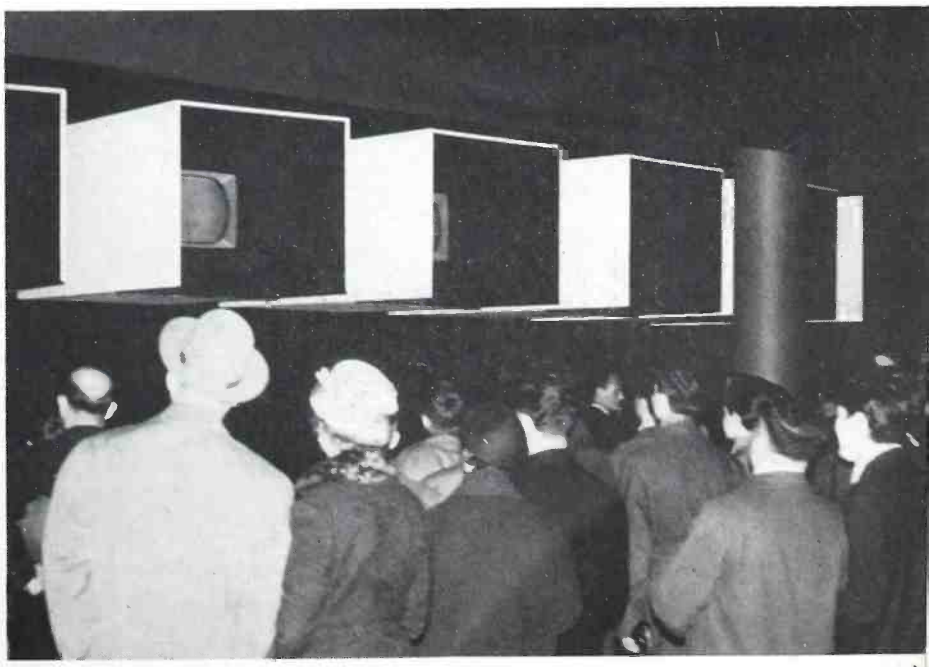
## Color TV Microscopy

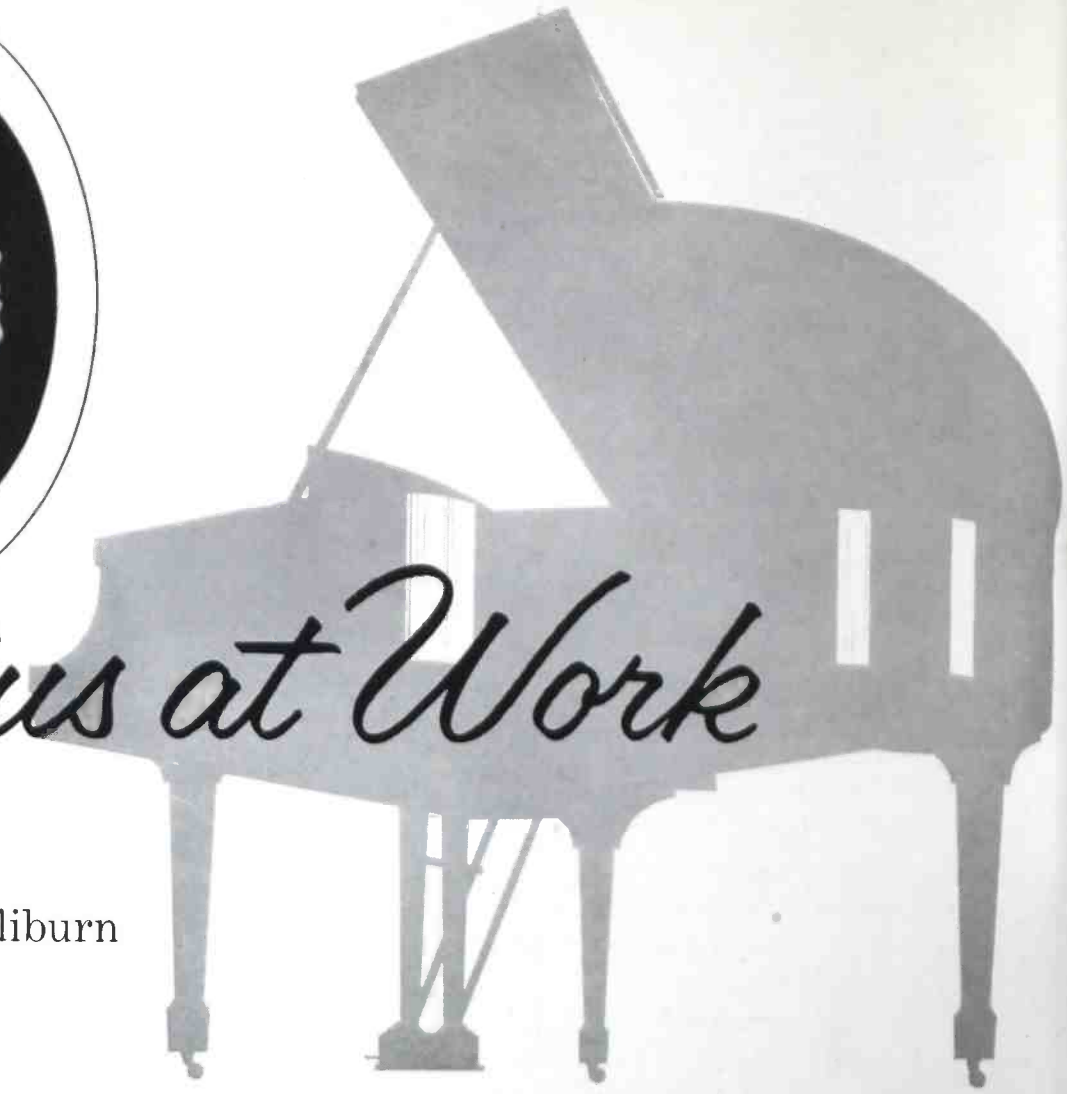
RCA, in collaboration with the Rockefeller Institute for Medical Research and the National Science Foundation, has set up an exhibit of color television microscopy in the Fair's International Science Hall.

The exhibit consists of a standard vidicon color camera, used in conjunction with a light miscroscope for the observation in natural color of stained specimens. The camera was furnished by RCA Industrial Electronic Products and was designed especially for medical and surgical use.

In addition to exhibits in U. S. Pavilion, RCA shows color TV microscopy display in International Science Hall.

An estimated 20 million Europeans are getting their first look at color television on RCA's closed-circuit hookup.





# Genius at Work

## Van Cliburn

THE WORLD of music reverberates with kudos for a young American pianist. Little known yesterday, Van Cliburn is today's artistic phenomenon, a keyboard prodigy whose critics already have placed him among the all-time masters of the piano.

For the 23-year-old musician from Kilgore, Texas, 1958 has been crammed with career-making events.

Within hours after Van Cliburn's sensational triumph in winning the International Tchaikovsky competition in Moscow on April 14, negotiations via transatlantic telephone were initiated with him by RCA Victor in keeping with its tradition of presenting to the public recordings of the worlds greatest artists.

Before Van Cliburn left his captivated audiences in Russia, RCA's President, John L. Burns, announced at the RCA meeting of stockholders in New York on May 6 that the pianist had signed with RCA Victor, joining a distinguished roster of musical giants including Paderewski, Rachmaninoff, Horowitz and Rubinstein.

In the Soviet, the gangling Texas pianist received the warmest tribute ever to be accorded an American. His home-coming multiplied the acclaim beyond all expectations. New Yorkers and citizens everywhere opened wide their arms and shouted his praise to the skies.

During the unprecedented excitement of his return, with a ticker-tape parade, welcoming committees, banquets, an audience with President Eisenhower, and concerts, the matter of finding time for the recording of his first album became a major problem.

But this album was successfuly completed in an all-night recording session at Carnegie Hall on May 29, only four days after his triumphant concerts in New York, Philadelphia and Washington. The opus recorded was Tchaikovsky's Piano Concerto No. 1 in B Flat Minor, which he performed in the Moscow competition.

Kiril P. Kondrashin, the Russian maestro, who conducted for Cliburn in the Soviet and on his American concert tour, was at the baton of the famed Symphony of the Air Orchestra for the recording session.

Kondrashin later accompanied Cliburn on a pilgrimage to the grave of the great Russian composer Rachmaninoff in Westchester County, New York, where they planted a lilac cutting in soil brought from Russia.

Anticipated demand for Cliburn's first RCA Victor recording is so great that all of the company's plants were made available to get it on the market as quickly as possible. Because of this tremendous public interest, "The RCA Victor Society of Great Music" has chosen the recording as a mid-summer main choice for distribution in cooperation with the Book-of-the-Month Club.

Some critics believe that Van Cliburn is certain to become one of the biggest selling names in classical music recording in this generation.

Cliburn made his first recording for RCA Victor in all-night session at Carnegie Hall with the Russian, Kiril P. Kondrashin, conducting.

The young Texan received a tumultuous ovation in concert at Carnegie Hall.

Broadway ticker tape parade honored Cliburn.

While the winning of the Russian competition brought Van Cliburn to the attention of music lovers all over the world, many commentators have pointed out that, although barely known by the public, he has been highly regarded among American musicians and music critics for several years. The pianist has won this country's top musical awards, and as one critic wrote, at least one award, the Leventritt, has even more exacting requirements than the Moscow competition. This award had been vacant for five years when Cliburn won it because the jury did not feel anyone during that time had met its standards.

After winning the Leventritt in 1954, Cliburn went on a 30-concert tour which included appearances with such orchestras as the Cleveland, the Buffalo Philharmonic, Detroit Symphony and Denver Symphony.

Van Cliburn started taking music lessons at the age of three from his mother, who nearly became a concert pianist herself. At twelve, he appeared in Carnegie Hall as the Texas winner of a nationwide competition arranged by the National Music Festival. He later studied at New York's Juilliard School of Music, and it was one of his teachers there who suggested entering the Moscow competition.

Becoming an international celebrity overnight, the young pianist is faced with heavy demands for concert appearances. He plans forty-five concerts with seventeen major orchestras this summer and next season.

Cliburn on the Steve Allen Show.

# Radio-TV Center Dedicated

## New NBC Facilities in Washington unique in many features

DEDICATION of the new $4 million television and radio center housing the National Broadcasting Company's Washington, D. C., facilities has opened a new chapter in the story of color television.

It marked the unveiling of the first station ever to be designed and built from the ground up for color television, with the most modern color equipment ever to be installed in a broadcasting facility.

The significance of the new NBC installation was emphasized by the fact that it was formally dedicated by President Dwight D. Eisenhower on May 22. He became the first Chief Executive to appear live on color television from the nation's capital. Vice President Richard M. Nixon laid the cornerstone of the building last year.

The dedication ceremony was broadcast coast-to-coast over the NBC Television Network and the NBC Radio Network.

The new center gives WRC and WRC-TV, NBC owned and operated stations, broadcast facilities that were specially planned for the needs and problems of local-station operation and that represent the highest degree of flexibility and simplification ever attained, NBC engineers said.

The engineers drew on experience gained in the designing and installation of color facilities at NBC owned stations in Chicago and Buffalo. The objective was to provide maximum utility and ease of operation, in keeping with the limited space and personnel at the local-station level.

WRC-TV's main color studio is 100 feet by sixty feet. Adjoining it is a small commercial studio. Color cameras can move directly from one studio to the other, facilitating smooth transitions in the programming.

A feature of the studios is a unique lighting arrangement. Lighting changes during a show are handled from the control booth, under the supervision of the director, after the changes have been pre-set for the entire program.

The color installation, using RCA equipment, is expected to become a model for other stations planning to convert to color.

Historically, the start of color operations in the new building has special meaning. It was in the old studios of WRC-TV, in the Sheraton-Park Hotel, that compati-

Gen. Sarnoff told the President that the Company would continue to do its very best "to make what contributions we may, or can, towards the objectives for which our nation and you as its leader stand. . . ."

Ceremony was carried on radio and TV.

ble color television, pioneered and developed by RCA, was first demonstrated to Washington officials. For a period of many months, beginning in 1949, compatible color broadcasts on an experimental basis, were on the air in Washington. On December 17, 1953, compatible color standards based on the RCA system were approved by the Federal Communications Commission.

In his dedication address President Eisenhower said that it is highly important that there should be the fastest and best possible kind of communications system between the people and their government. "Decisions of a nation and of a government," he said, "that at one time could tolerate three or four weeks of study now demand almost instantaneous reaction."

This theme was also noted by Robert W. Sarnoff,* President of NBC, in his remarks introducing the President, when he pointed out that the presence of so many high ranking government officials underlined the significance of the occasion. "To us in broadcasting," he said, "it is a persuasive reminder of our role in interpreting the Washington scene to the 97 per cent of Americans within reach of our sight or sound signals."

On the speakers' platform with the President and Mr. Sarnoff were Brig. General David Sarnoff, RCA Chairman of the Board; John L. Burns, President of RCA; Carleton D. Smith, NBC Vice President and General Manager of WRC and WRC-TV, and leaders of the federal government.

Responding to President Eisenhower's remarks, General Sarnoff noted that, having served under him in war and peace, he knew first hand how deep was the President's interest in all forms of communication.

"Gratified as we are by your presence here today, we consider it a tribute not alone to our company and to our people but to the entire art and industry of communications, whose development and whose progress has always, as I know, excited your interest," General Sarnoff said.

Tape copies of the program have been sent to the White House for President Eisenhower's personal retention and to the Library of Congress for its permanent archives.

The building is situated on a seven-acre tract on one of the highest elevations in the District of Columbia. Its triangular 80-ton tower reaches skyward 849 feet, the highest broadcasting antenna in the area.

The marble and glass lobby has large window cases suitable for displaying the latest RCA television and radio equipment. Two elevator shafts with lobby entrances provide rapid service between the three floors. The facilities include a community room available to civic and social organizations.

* *Elected Chairman of the Board and Chief Executive Officer of NBC on July 11, 1958; Robert E. Kintner elected President.*

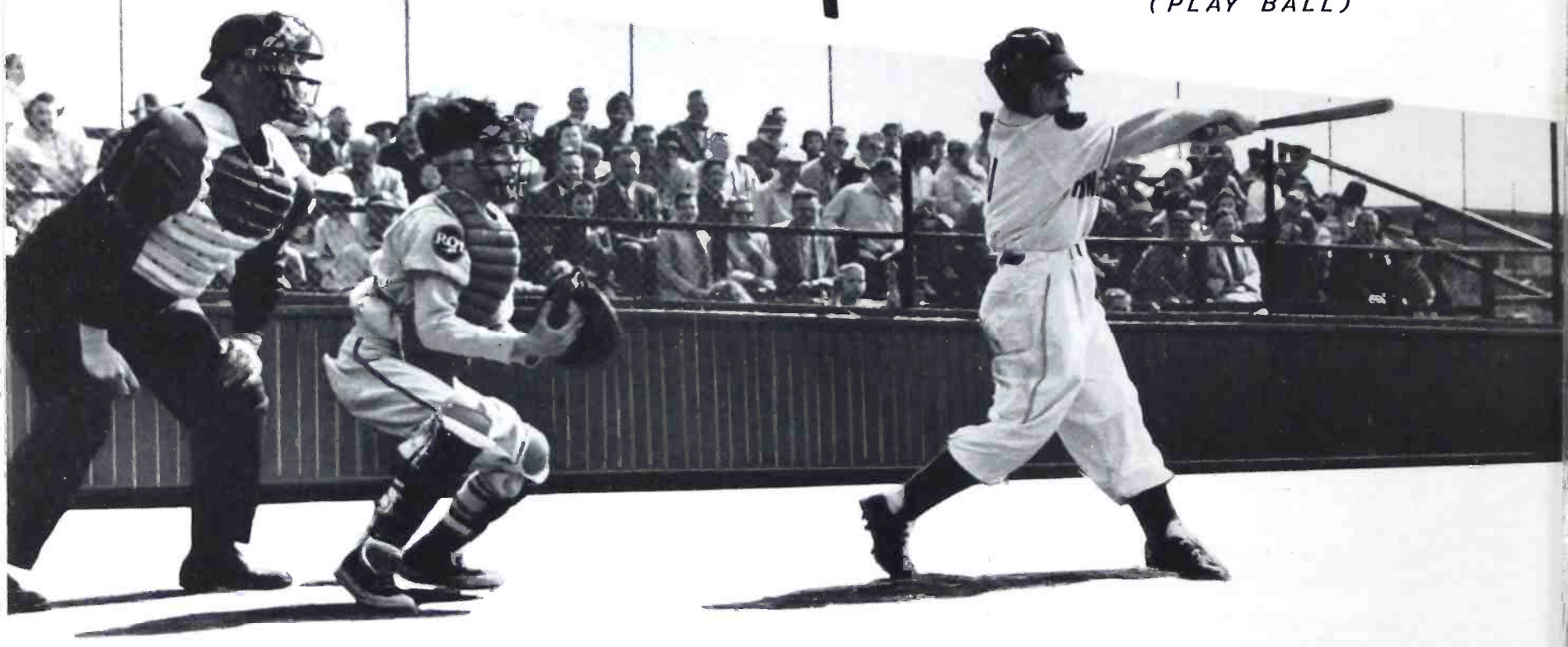
The President likened the facilities to "the radar room in a big battleship." Carleton D. Smith, left, and Robert W. Sarnoff, explain equipment.

Station is on one of highest points in District.

General Sarnoff and Robert W. Sarnoff point out plaque with President's likeness in bas relief.

# Ball Spielen!

*(PLAY BALL)*



## "RCA Electrons" go to bat in Germany's Little League

THERE'S a snappy new phrase bidding for attention in the big leagues of international diplomacy. It's "Ball Spielen!" Play Ball!

The originating point, paradoxically enough, is a little league in Western Germany, recently activated and captivated by America's favorite pastime.

U. S. Embassy and military officials at the capital city of Bonn set the sandlots in motion for this happy development. And sharing credit are a number of American industrial firms, including RCA, with humanitarian as well as business interests abroad.

About the same time this Spring that President Eisenhower was winding up to toss out the first baseball of the 1958 season for the Washington Senators, an enthusiastic aggregation of German and American youngsters were preparing for the opening of Bonn's first little league.

U. S. Ambassador to West Germany, David K. E. Bruce, officially opens season.

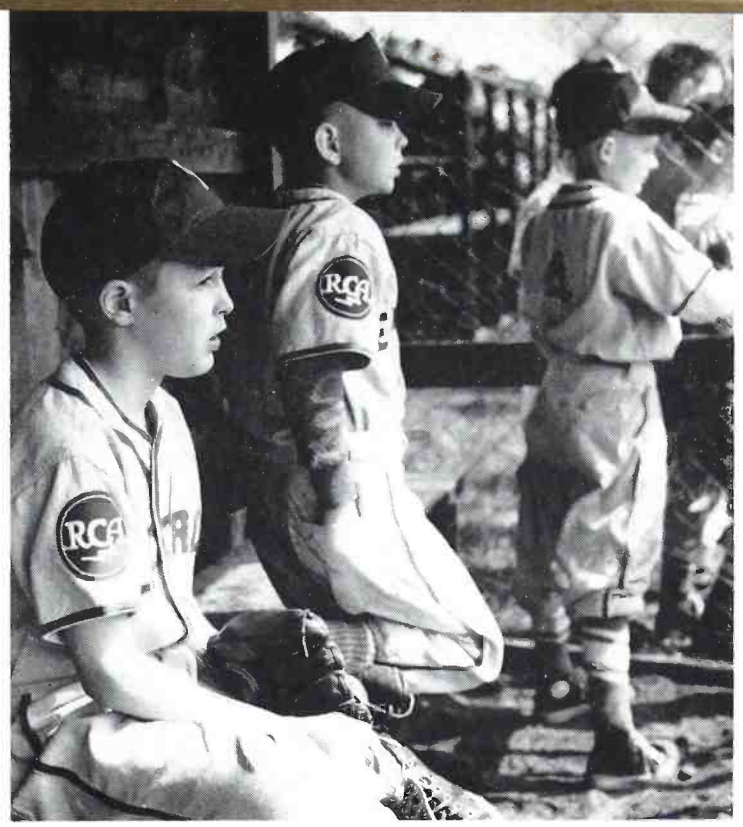
Comprising the teams were potential home run whacking sons of U. S. Embassy, military and civilian personnel stationed at Bonn, and a number of young Bonn citizens with a bent for the American game.

Behind the scenes was an equally enthusiastic group of adults headed by Ambassador David K. E. Bruce, our envoy to Western Germany. Their combined efforts brought the little league into being, with Air Force Lieut. Colonel Lyn T. Blake as chairman of the finance committee. On hand as a spectator was Governor Robert B. Meyner of New Jersey.

Besides RCA, sponsors of the teams are Pan American World Airways, Republic Aviation Corp., and North American Aviation Corp. Thus pitted against one another for the season were the RCA Electrons, the Pan Am Jets, the Republic Thunder Chiefs and the North American Scorpions.

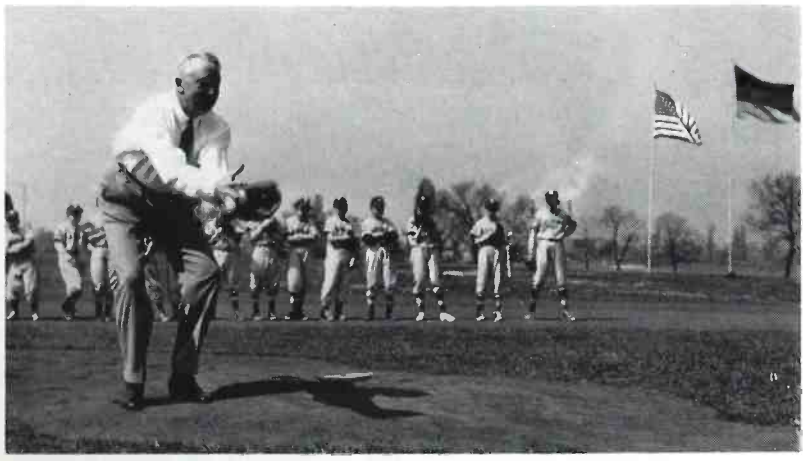
The opening game was played on May 3. It marked the debut of RCA Electrons and the Republic (Aviation) Thunder Chiefs amid such widespread excitement that the event was televised. It was a close game and a low score for little leaguers — with the Electrons being edged out, 5 to 6.

Since then, the boys with the RCA shoulder patches have redeemed themselves. They are now in first place and have their eyes on the league championship. This brings joy to Ambassador Bruce, whose 10-year-old son, David K. E., Jr., is a hard-hitting member of the team, and to Rolf C. Armer, Manager, Defense Electronics Products, RCA International Sales, out of whose budget came the marks for the uniforms.



With RCA Electrons in dugout is Ambassador Bruce's son, David K. E. Bruce, Jr., left.

Flag raising ceremony was held on opening day. Three American firms, besides RCA, fielded a baseball team in Germany's Little League.



Ambassador Bruce warms up to toss out the first ball of the season.

High ranking civil and military officers turned out for opening ceremony. Ambassador Bruce is on left, New Jersey's Governor Robert B. Meyner is third from left. Welcoming speech was made by the Burgermeister of Bonn suburb where league plays.

# electronic detection

ELECTRONIC "eyes" have taken over the inspection assignment in many branches of industry to protect product quality and make production lines move faster.

In beverage plants throughout the country photo-electric optics peer into soft-drink and beer bottles in search of foreign particles.

Electronic detectors work in food, candy and chewing gum processing, in plastics and textile milling, in rock quarrying and tobacco manufacturing to guard against the stray bit of metal that may contaminate a peppermint candy or damage a machine and shut down a production line.

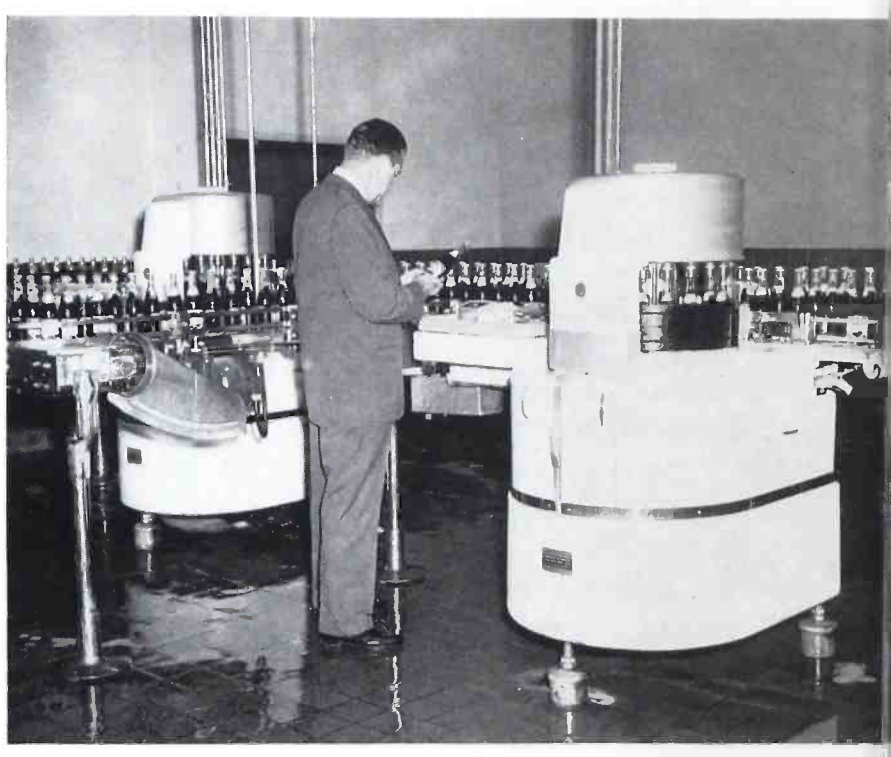
Electronic aids to industry have been pioneered by the Radio Corporation of America, and are marketed by RCA Industrial Electronic Products, which recently announced a number of new designs and ingenious applications for its devices. For example, a textile mill in North Carolina has installed an RCA metal detector at the point where its roll of cotton fabric passes at high speed into a shearing machine.

The material is scanned by a high-frequency electromagnetic field. Any stray bit of metal disturbs this field and the detector sends out a signal which automatically stops the machinery.

Metal particles such as foil and hairpins are a constant plague in the packaged food industry. The metal detector's radio eye has the ability to look inside the cereal box or candy bar and find stray bits and pieces that no other inspector could locate.

Electronic inspection is now considered an indispensable safeguard in many industries. Candy makers have found, for example, that their cooking kettles, tanks, and pipes sometimes build up deposits along the interior walls. Fragments of this deposit occasionally break off and get cooked and packaged with the final product. In breaking away, such particles take with them a thin metallic scale from the tank or pipe. This is enough to cause lights to flash and bells to ring in the presence of the metal detector.

In some industries, on the other hand, the presence of metal in a packaged product is essential rather than undesirable. A large Brooklyn pharmaceutical manufacturer packages hypodermic needles in large quantities, sterilizing, wrapping, and sealing them automatically.



RCA's beverage inspector, known as BIM, automatically removes bottles containing impurities from assembly line.

A detector is stationed over the moving belt to make certain that each box contains its needle.

The electronic guardians are in growing demand in heavy industry and manufacturing. A quarry operator in Kingston, N. Y., uses the largest of RCA's five types of detectors to inspect rock as it moves along a belt to the crusher. Stray nuts, bolts, and pieces of steel cause the detector to stop the belt, saving the crusher from a costly breakdown.

Another device belonging to the same family as the metal detector is the electronic beverage inspection machine, known as BIM.

Bottles are fed to the machine on a conveyor after being filled and capped. They are spun to swirl the contents and then halted for an instant between a bank of phototubes and a beam of light. Any moving particles register a light change which is electronically amplified to throw a selector switch. Bottles containing impurities are automatically removed from the line.

The uses of electronic and electro-mechanical devices in today's automated industries are as varied as these examples suggest. To the plant manager such machines are justified because they pay for themselves through increased efficiency and lower labor costs.

NBC's Robert W. Sarnoff (r) with E. R. Vadeboncoeur, President of WSYR and WSYR-TV.

# TV-Newspaper Relations

THE relationship between television and newspapers was examined by Robert W. Sarnoff, President of the National Broadcasting Company, in a speech dedicating new facilities at stations WSYR and WSYR-TV, Syracuse, N. Y., on June 17. Mr. Sarnoff declared:

"The broadcaster is questioning some newspaper coverage of television in terms of three sections of the paper. One is the main news section which carries reports of alleged improper conduct in Washington. The broadcaster says he does not object in the slightest to Washington investigations of any aspect of broadcasting or government administration — for such is the essence of the democratic processes by which he lives. But he has begun to ask whether any leaked story from Washington concerning television is not a surer avenue to page one for a reporter than a trunk murder.

"To illustrate, on Sunday, June 1, *The New York Times* carried a front-page article about the Justice Department's insistence that the FCC eliminate three basic elements of networking for anti-trust reasons. Apart from the fact that the Justice Department had expressed itself on these network operations two years ago, the point the broadcaster questioned was the play given the story. It was the lead domestic news story. Only the agony of France overshadowed it. Not even the staggering fatalities of Memorial Day could equal it.

"The second newspaper section under question is television show criticism. The broadcaster says he understands the panning of an individual Western or quiz show. The movies and the theater get that too. But why, he asks, must that panning be coupled with a characterization of the entire television service as degraded and with the incorrect claim that we are losing millions of disenchanted viewers? Why must the fact that the TV channels carried this past season the greatest number of informational, cultural and educational special programs in television's history be submerged in the backwash of things wrong?

"The third newspaper section under the broadcaster's questioning gaze is the business section, and particularly the advertising news columns. Here he reads that television costs are soaring, that advertisers are switching from television to the print media who contend they are more efficient, more economical buys. Why should the annual meeting of newspaper advertising executives be covered like a summit conference? Why should one major paper, taken at random, give more than 1,500 agate lines to the last Newspaper Advertising Executives Convention, yet not one agate line to the annual TV Bureau of Advertising Convention.

"Over the past ten years, most broadcasters say they have tended to ignore or shrug off print hostility. Television was growing so enormously, the sponsor demand for time so great, the growth of audience so rapid, that most executives did not allow their sense of well-being to be ruffled.

"But this has changed as the economy has changed.

"The impact of a recession has specific, and different, realities for television. Unlike the print media, who reduce their number of pages when advertising dwindles, television must continue to program its time periods whether programs are sponsored or unsponsored. Consequently, the swing between profit and loss is far sharper and the risks far higher. A handful of prime evening time periods left unsponsored can transform the figures on any network's ledger from black ink to red ink."

# R by Overseas Radio

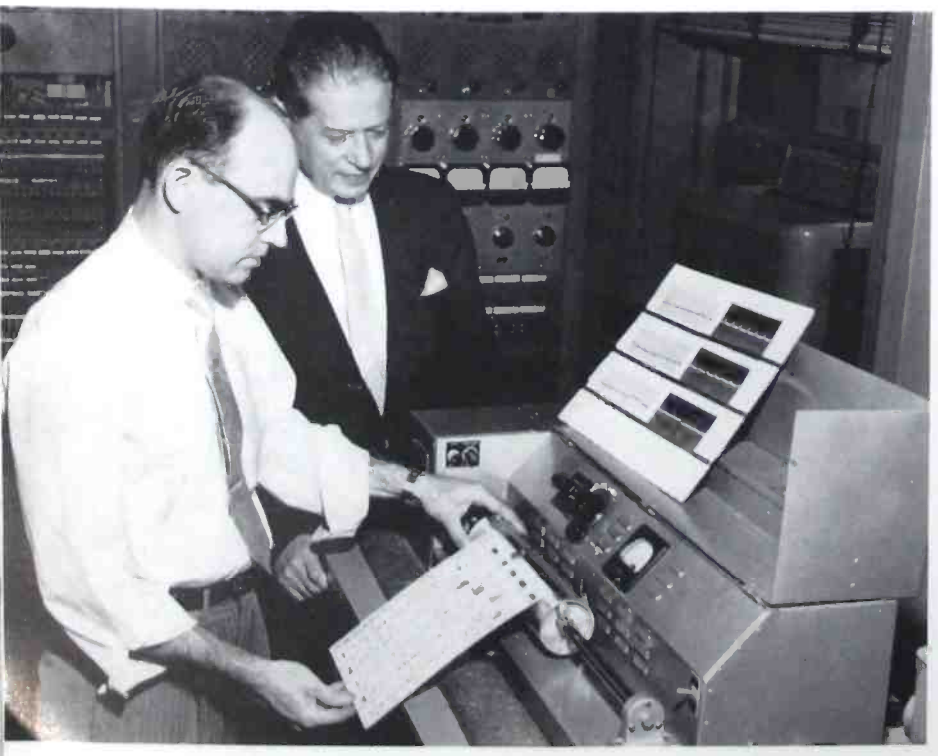
CARDIAC victims may soon be able to travel in almost any part of the world and, at the same time, remain in the care of their own home town specialists. This has been made possible by a new system which will allow physicians to diagnose and recommend treatment for cardiac conditions by international radiophoto and radio program circuits.

The system was conceived by Dr. Arthur Briskier of Mt. Sinai and French Hospitals in New York, and has been successfully tested at RCA Communications, Inc., 66 Broad Street, New York.

The new technique makes it possible for a physician in the United States to diagnose almost immediately the condition of a patient who might suffer a heart attack while traveling abroad.

During the tests, Dr. Briskier transmitted the tape recorded sounds of a patient's heart beat from New York to Rome and Paris. Simultaneously, the patient's electrocardiograms were also transmitted by radiophoto to these points. In order to test the quality of the transmissions, the signals were rebroadcast from Rome and Paris back to New York.

Dr. Briskier said the system will also provide the means whereby physicians in all parts of the world can quickly have their cases evaluated by cardiac specialists located thousands of miles away.



Dr. Arthur Briskier (r) developed method of diagnosing heart ailments from cardiograms sent by radiophoto.

Successful tests of the new technique have been carried out by RCA Communications' New York radio terminal.

# RCA-NBC Extend Leases In Radio City to 1982

SIDEWALK superintendents had a great and unexpected field day in the winter of 1932 as work on the RCA Building, world's largest commercial office building, was begun in New York. It seemed impossible that in the depths of the country's worst economic depression a structure of such magnitude could be undertaken.

As the building commenced to rise, the project itself became an inspiring demonstration of American resourcefulness at a time of crucial need for reassurance and confidence in the life of the Nation. With its completion Radio City was born in the now fabulous Rockefeller Center.

All of this came vividly to mind on June 28 when the Radio Corporation of America and the National Broadcasting Company, the first tenants to sign for space, extended leases valued in excess of $70 million.

Brig. General David Sarnoff, Chairman of the Board of RCA, who played a leading role in shaping plans for the center in 1930 and 1931, and Nelson A. Rockefeller, Chairman of the Board of Rockefeller Center, Inc., participated in ceremonies marking completion of the new agreements.

The leases were signed by John L. Burns, President of RCA; Robert W. Sarnoff, President of NBC; and G. S. Eyssell, President of Rockefeller Center. Covered is a twenty-year period, beginning in 1962.

General Sarnoff said: "In the years ahead, vast expansion is predicted for the electronics industry and we are confident that RCA will keep pace with this expansion. Our new leases take this into consideration. It is deeply gratifying to me to know that RCA's long-standing association with Rockefeller Center will be continued."

Mr. Rockefeller also expressed gratification over continuation of the Center's long relationship with RCA and NBC.

"It is particularly fitting," he said, "that the companies which shared my father's faith in the future of this great city in those dark depression days should be extending their association with the Center into the bright new years that lie ahead. For while the 1930's were years of uncertainty, there can be no doubt that the next twenty-five years will see swift and exciting and challenging developments. As leaders in television and electronics, RCA and NBC will continue to share in the dynamic growth of this country just as Rockefeller Center is expanding to keep pace with the growth of New York."

General Sarnoff and Nelson A. Rockefeller observe signing of leases by John L. Burns, G. S. Eyssell and Robert W. Sarnoff, extending RCA's tenancy in Radio City to 1982.

RCA moved its executive offices into Radio City from 570 Lexington Avenue on June 2, 1933. NBC completed its move from its former studios at 711 Fifth Avenue in November, 1933, and its first radio broadcast from Radio City took place on November 11, when the studios were dedicated "to the service of the American public."

# Ferrite Memory for the A·E·C

by Howard C. Enders

A DELICATE frame-like assembly called a ferrite memory, made up of thousands of tiny beads of magnetic material, strung on a web of fine insulated copper wires —somewhat like a miniature abacus in appearance—is being manufactured by RCA for use by the Atomic Energy Commission in a high speed electronic computer. Work on the assemblies is under way at the Materials Advanced Development Laboratory in Needham Heights, Massachusetts.

When completed, the newly designed assemblies will be shipped to the Los Alamos Scientific Laboratory in New Mexico. The Laboratory, operated by the University of California, is constructing the computer for the AEC.

Computers of this particular type are used for scientific computation. Other automatic computing devices, utilizing ferrite memories, will help to relieve the already over-taxed air traffic control systems. Such electronic computers will require higher speeds and greater capacities with the advent of jet airliners for passenger travel. Today, some of the giant computers require more than a million memory beads or cores. The cores in the memory frame for the AEC computer will store thousands of bits of information. They also have the ability to recall this information whenever requested and can do so in a few millionths of a second.

Each core is eighty thousandths of an inch in diameter or smaller than the head of a common pin. The beads are so small that 6,250 of them will fit into a small match box; 83,000 of them weigh only a pound.

Ferrites are inorganic chemical compounds formed by ceramic techniques from metallic oxides and are widely used in components—other than memory frames —for computers, television receivers, and high-frequency applications. Although ferrites are primarily a post-war development, they have an ancestor in the lodestone, a natural magnet first recognized more than 3,000 years ago.

An extraordinarily high degree of control is required during the processing of ferrite cores because of their small size, light weight, and critical electrical tolerance limits. There are many separate steps in the production of the cores, one of the most significant of which is the high-temperature "baking" process used to produce the dense ceramic properties. In this step, the principal electrical characteristics of the cores are determined by heating them to a temperature between 1,100 and 1,350 degrees Centigrade.

Inspection of memory core products presents a very real problem, as monthly production runs into the millions. Each core must be individually tested for both electrical and mechanical characteristics. This operation is performed on high-speed automatic equipment which can test as many as four cores per second. During the test, the core is subjected to the operating conditions that it will receive in computer use. In addition, these conditions are varied so that the core is tested at levels 10

RCA technician weighs powder for ferrites at the Materials Advanced Development Laboratory, Needham Heights, Mass.

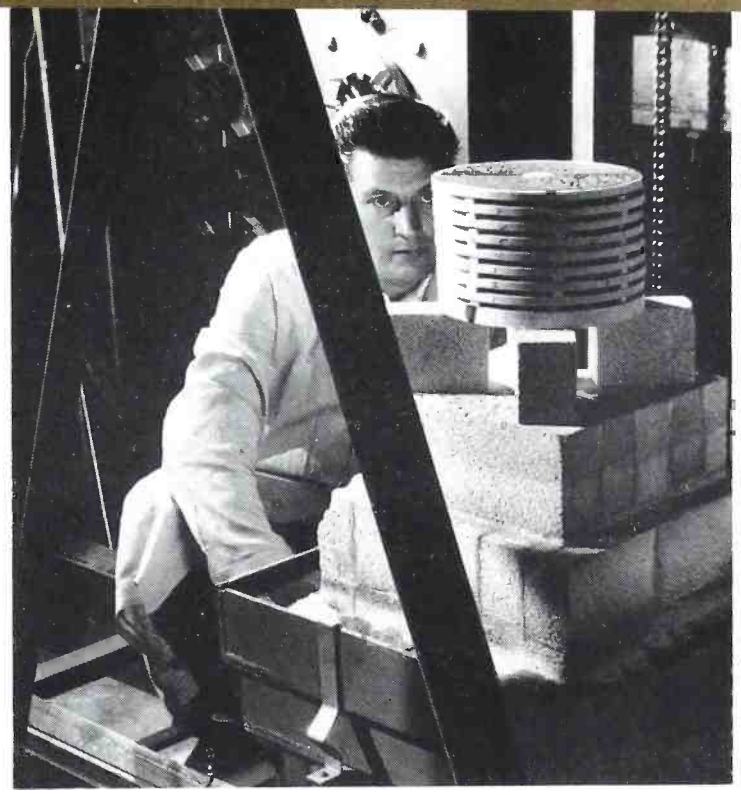
per cent below and above the specified operating conditions. This type of testing provides a core of greater reliability.

### How Memory Frames Are Made

At the Needham Heights Materials Laboratory, the ferrite cores are assembled into a mesh-like square called a matrix. Skilled operators hand-thread four thin insulated copper wires through the center of each core. When completed, the matrix resembles a series of interwoven wires with the ferrite cores at each point where the wires cross. The matrix is then placed into an RCA-developed U-shaped, aluminum frame. Design of the frame permits either vertical or horizontal mounting in the computer. Because the frame can easily be made in many different sizes or shapes, extra costs for special engineering or tooling on special core arrangements are limited.

The AEC computer memory will be among the first in the country to utilize an assembled stack of RCA's new ferrite memory frames. The frame's sturdy aluminum construction offers mechanical strength and stability. Compactness makes possible important reductions in the stacking height of frames within the computer.

The Materials Advanced Development Laboratory, a unit of the RCA Semiconductor and Materials Division with headquarters at Somerville, N. J., was opened in August, 1956.

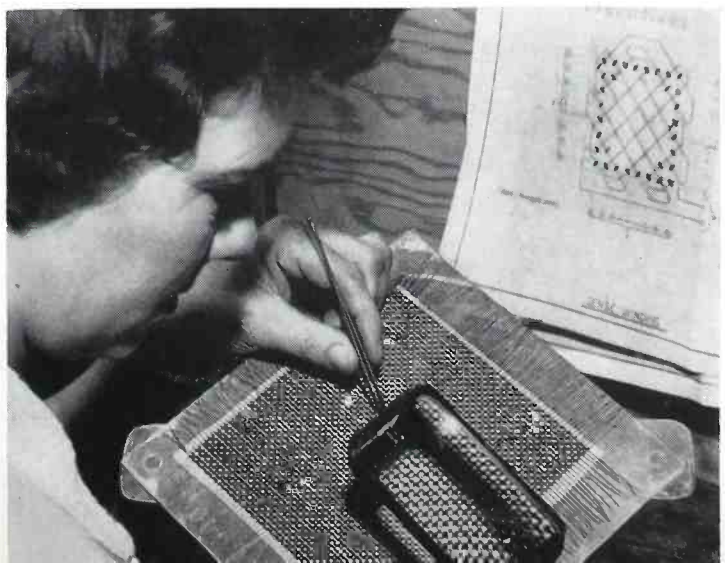


Beads are subjected to temperatures of from 1,100 to 1,350 degrees centigrade in electric furnace; principal characteristics of beads are set during process.

Four beads a second can be tested in high-speed automatic equipment to determine their electrical characteristics.

Tiny beads of magnetic material, known as ferrite cores and used in memory of computers, are produced in pressing machine.

Memories for computers are formed by sewing fine strands of insulated copper wire through the tiny magnetic cores.



# Amplifying and "Storing" Images

A NEW family of electronic devices that appears destined to ease the task of the doctor, the radiologist and the radar viewer is taking shape in RCA Laboratories.

Principal identifying features of these devices are a thin-panel type of construction, plus an ability to receive dim or invisible radiation on one surface and convert it to bright electronic light on the other.

Three new members of the family have made their public debut in experimental forms:

► A thin-screen amplifier for X-ray viewing, capable of multiplying by 100 times the brightness of X-ray images in certain types of medical examination, and at the same time reducing exposure of the subject to X-ray radiation.

► Two types of storage display panels that can brighten and hold for prolonged viewing projected radar and other light images to which they are exposed only for small fractions of a second.

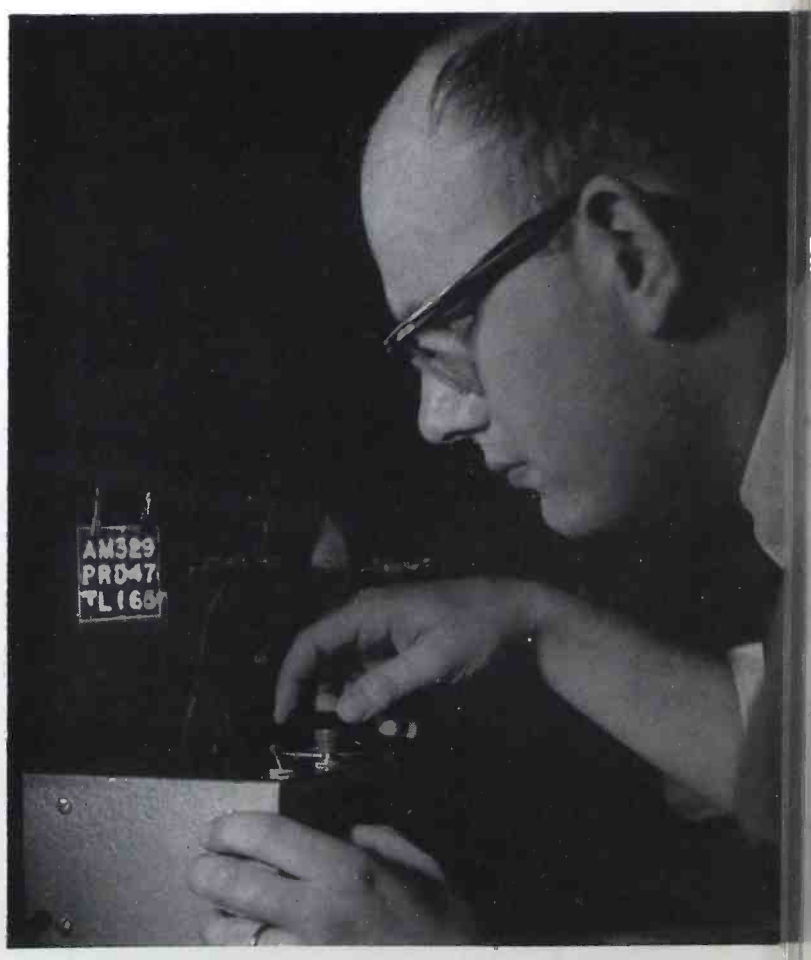
All three of the devices employ principles similar to those of the electronic light amplifier developed at RCA's David Sarnoff Research Center, Princeton, N. J., and demonstrated in early 1954. Dr. D. W. Epstein, who supervises the RCA Laboratories research in this area, describes the basic principle in this way:

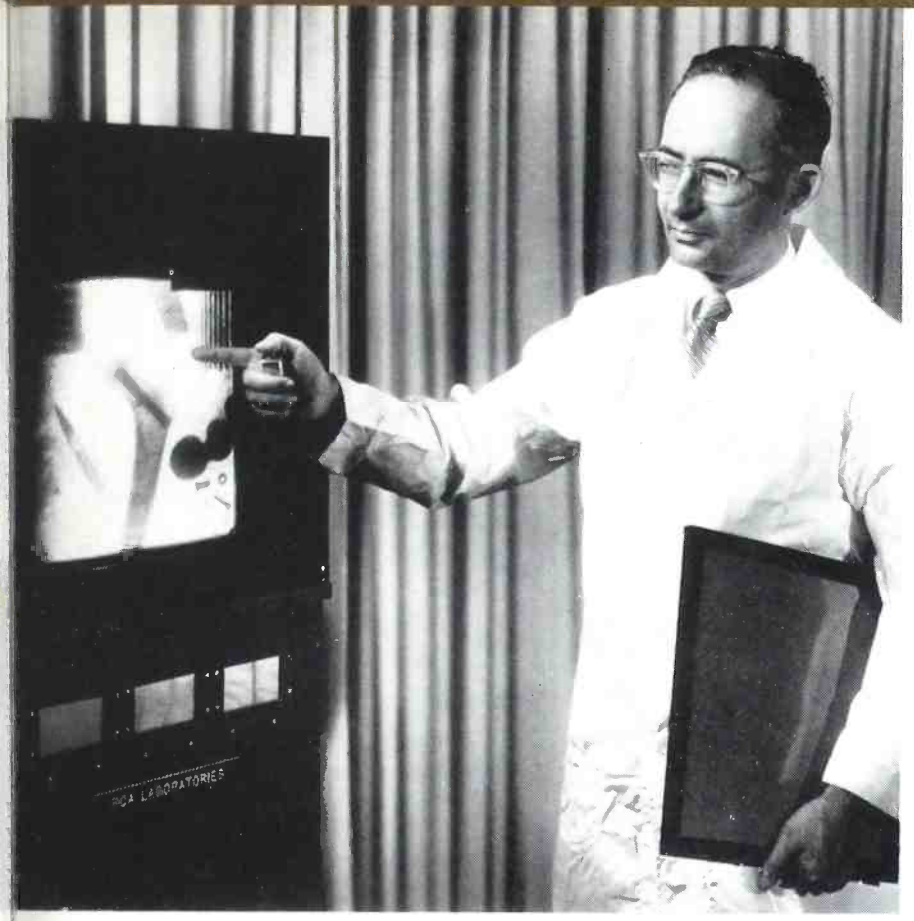
The light amplifier, and the panel devices that have been developed subsequently, employ arrangements of two special materials in adjoining layers sandwiched between transparent electrodes to form a thin screen. One of these materials is a photoconductive powder which conducts current only when it is exposed to X-ray radiation or to visible or invisible light. The other material is an electroluminescent phosphor, also in powder form, which emits a bright light when an electric current is passed through it.

In operating the panel devices, a voltage is applied across the sandwich structure. In the absence of X-ray or light radiation, the photoconductor acts as an insulator, blocking the passage of current.

When an X-ray or dim light image falls on the photoconductor, however, the material acts as an electrical "valve," allowing the current to pass through to the electroluminescent phosphor in a pattern corresponding to the patrern of the X-ray or light radiation. The result is reproduction of the image in the bright light emitted by the electroluminescent material.

Radar and other light images can be held for viewing on experimental storage panels.






Amplifying screen is capable of increasing by 100 times the brightness of X-ray images.

### The X-Ray Amplifier Panel

The first of the new experimental devices to make its public appearance was the thin-screen amplifier for X-ray viewing, demonstrated by Benjamin Kazan, of the RCA Laboratories research staff, before a meeting of the American Roentgen Ray Society in Washington, D.C., where it was voted the best exhibit among the new developments displayed. Mr. Kazan, who developed the device with the assistance of James E. Berkeyheiser and John Bernath, emphasized several novel features of particular interest to the radiologists:

1. It provides a stationary display of an X-ray image not only some 100 times brighter but with greater visual contrast than those produced on conventional X-ray viewing screens, permitting immediate viewing in lighted surroundings.

2. The device holds its bright image for extended viewing up to thirty seconds after a short exposure to X-rays, making possible a substantial reduction in the amount of X-ray exposure in direct viewing of camera recording of stationary images.

3. A new electronic "erasing" technique permits the viewing screen to be cleared at any moment in a fraction of a second and reused immediately for viewing a new image.

While the screen cannot yet be used for continuous viewing of motion with low-level X-rays, according to Mr. Kazan, the achievement of this end is the long-range objective of a continuing research program.

Such a panel might be used by a surgeon to obtain visual reports of progress during certain types of operation. One such case is the pinning of a hip, in which the location of the pin must be carefully determined by observation. Such checking during the operation is now usually accomplished by recording the X-ray image on film, hurriedly developing the film outside, and rushing the result back into the operating room. With a thin, large-area panel device, a bright X-ray image could be produced on the spot after only a short exposure to X-rays, and retained up to half a minute.

### Storage Display Panels

Two additional experimental members of the electronic panel family were introduced at the most recent Electron Devices Meetings in Washington by other members of the RCA research staff. Both were thin-screen devices capable of amplifying and "storing" images for prolonged viewing in radar and other applications.

One of these, developed by Dr. F. H. Nicoll, involves the application of a new electronic principle to achieve an amplifier which, after a 1/100-second exposure to a dim image, stores and displays the image in bright form for several minutes or longer. The other type, developed by E. E. Loebner, H. O. Hook, and D. C. Darling, under a Signal Corps contract, is a high-resolution device combining picture detail with long image persistence.

Dr. Nicoll described the new electronic principle in the first storage panel as the application of a previously unknown phenomenon in cadmium selenide, a photoconductive material. It was found that under the influence of applied voltage and exposure to light, the conductivity of cadmium selenide will increase sharply and will remain high for long periods after the light source has been cut off.

By using the material as the photoconductive layer in an amplifier panel, it is possible to maintain the flow of current to the electroluminescent layer for long periods after the light source is removed, and to erase the image at any time by interrupting the voltage for a fraction of a second.

The second type of storage panel was described by the development team as an arrangement of photoconductive and electroluminescent materials in tiny cells on a specially fabricated glass plate. In this design, images can be stored by an optical feedback process, using the light emitted by the electroluminescent material to maintain the conductivity of the photoconducive material.

Storage of images by this means is theoretically infinite, the RCA scientists said, although in practice the laboratory devices have been limited to storage of about fifteen minutes after extremely brief exposure to the light source.

# THIS THING CALLED MUSIC

*In a statement before the Senate Subcommittee on Communications, George R. Marek, Vice President and General Manager, RCA Victor Record Division, analyzed methods of record companies in selecting hit tunes and promoting them. Some of his pithy and forthright comments are presented on this page.*

THE task of selecting music that will be a "hit," is by its very nature so difficult and perilous that it would be utterly absurd to handicap ourselves by predetermining the composers or publishing firms from whom we should take our music. Let us clearly understand how a hit is promoted. There are several ways: If it's used importantly in a motion picture, that could help a great deal. If the jukeboxes buy it, so that the kids can put in their nickels or dimes and hear it, that helps the sale of the record to the home. But it is quite true that of all ways of promoting a record, the most important is having it played on radio and, to a certain extent, on television, although radio still has a greater influence on the popularity of records than television.

So we now come face to face with a very important gentlemen, the disc jockey. He too is not an entirely independent potentate because he too must play what his audience enjoys hearing. But let's give him everything that is his due and say that promotion via disc jockey is the one most important influence in exposing a new record.

The best kind of promotion, hoopla, advertising, publicity, or what have you, is no guarantee that the piece of music on which it is expended is going to please the public. In the most fundamental sense, we cannot sell anything. The public has to want to buy it. Unless the record has within it the germ of success—and don't ask me what that germ is because I do not know—unless it has that germ, no amount of drum-beating will transform a flop into a hit. Many of us so-called "experts" have our garages or apartments filled with records our distributors and dealers could not sell which we "knew" were going to be great hits. We promoted them well. We spent time, money, effort on them. They were failures.

## Waltz Once Suspect

In the 19th century when the waltz came up it was predicted that "this licentious dance would open the sluice gates of immorality and degradation."

Is rock and roll, I quote, "an expression of protest against law and order, that bolshevik element of license striving for expression in music?" Is it, I quote, "an influence for evil?" Does it, I quote, "with its moaning saxophone and the rest of the instruments with their broken, jerky rhythm, make a purely sensual appeal?" Does it, I quote, "call out the low and rowdy instinct?" Well, what I have just quoted you was not said about rock and roll but was said by the National Music Chairman of the General Federation of Women's Clubs in August, 1921, in an article in *The Ladies' Home Journal.* She was talking about the jazz which we now have recognized as legitimate music and as part of the American musical tradition.

Indeed, I think none of us has a right to say what the public should or should not hear, what is good taste and what is bad taste. We have a right to our opinions, to our own likes and dislikes, as long as they remain opinions only. I do not want to be an arbiter of taste.

There has sprung up a great new appetite for music in our country, and with all modesty I may say that the recording companies, who have made so wide a repertoire available to the public, are to be thanked for a fine contribution to our musical development. There should be room for all music — rock and roll and sweet songs and Berlioz and Sam Barber's new opera, "Vanessa."

There is such room! When 210,000 people buy a fairly expensive recording of Beethoven's Ninth Symphony conducted by Toscanini, one can hardly claim that America is musically illiterate and its taste debauched.

# Belt Radio for Crime Fighters

SOMETHING new is being added to the belt of the cop on the beat—a miniature radio station to keep him in constant touch with headquarters.

The foot patrolman long has been on his own between telephone call boxes. Reaching a fixed point of communication can be a time-consuming operation in an emergency, drawing the policeman away from the scene of action.

The Radio Corporation of America has come up with a compact solution in the form of a small receiver and accompanying transmitter which the crime fighter straps on his belt beside his service revolver and other tools of his trade.

The RCA Personalphone has aroused the interest of public safety officials, including the police department of New York City.

One of the problems facing New York's "Finest," has been patrolling the city's sprawling park system, all 34,000 acres of it.

New York Park Commissioner Robert Moses has announced that by the end of this summer police patrolling the city's large parks will be equipped with RCA pocket-size radio equipment as part of a concerted drive on crime.

A lapel type speaker or an ear plug version can be used. In either case, the passerby would have to look twice to see that the cop on the beat was wired for broadcasting. The transmitter and receiver may be kept completely out of sight under the policeman's uniform coat.

Only 6½ inches long, the receiver is slim enough to slide into a man's shirt pocket and weighs just 10 ounces. Completely transistorized to permit such miniaturization, it has a receiving range up to two miles in communication with other mobile units and even longer when operated in connection with a fixed station.

The New York police plan includes a transmitter in Central Park at 79th Street.

The plastic case of the receiver is equipped with a clip for fastening the unit to a belt if the leather pouch is not used. On top of the case is the on-off switch and a plug for the cord feeding either a lapel loudspeaker or an earpiece reproducer. The unit is powered by a single small battery capable of operating up to 150 hours.

The miniature frequency modulation transmitter weighs only twenty-eight ounces with its battery. Approximately the same shape as the receiver, the transmitter is equipped with a carbon-type microphone the size of a silver dollar. There is a push-to-talk switch at the base of the microphone.

Both the transmitter and receiver operate in the 150 megacycle band and will work compatibly with any existing standard radio system.

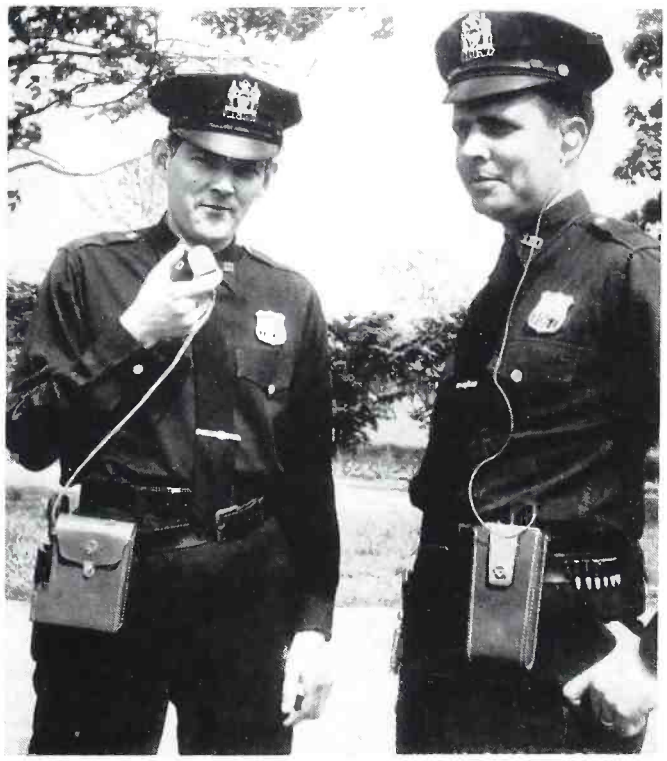
While police applications of the RCA pocket-size two-way radio have received considerable attention, the compact unit is capable of a wide variety of uses.

Among these are fire department communications, the radio linking of plant guards and in connection with construction projects.

A firefighter equipped with a belt radio unit can maintain radio contact with his chief, calling for assistance where needed and giving his superiors an on-the-scene description of conditions in a blazing building.

The plant guard encountering out-of-the-ordinary situations can summon help quickly by radio.

The foreman on a construction job can direct widely separated crews from a central point.



Miniature two-way belt radio will materially aid police in patrolling New York's 34,000-acre park system.

# DRAWING BOARD CHALLENGE

AT A TIME when industry is counting heavily on change to spur sales, the role of the industrial designer assumes increased importance.

Where do these designers get their ideas? How long does it take for a design on the drawing board to become an actuality? The answers to these questions are as varied as individuals are themselves.

"The industrial designer, most emphatically, cannot put too much emphasis on design," says Bernard A. Grae, Manager of Appearance Design, RCA Victor Radio and "Victrola" Division, "He must keep in mind that all designs have to fit the following description: Functional, useful, ingenious, demonstrable, and customer-satisfying."

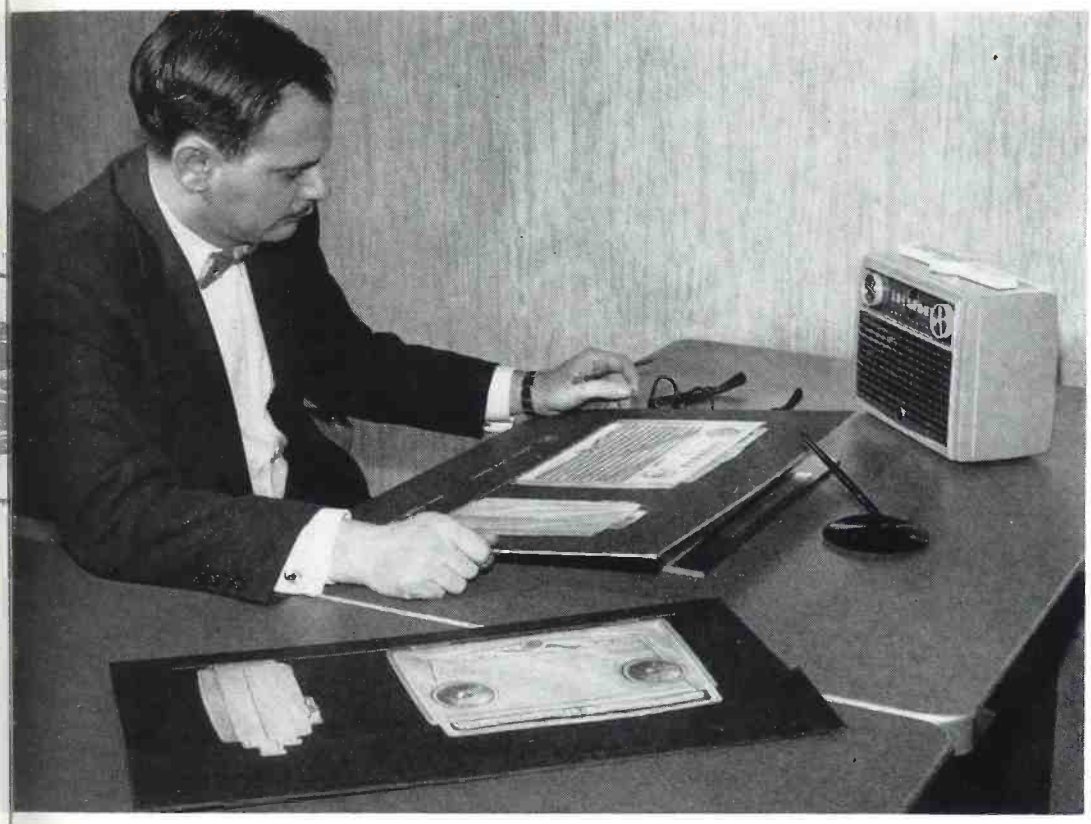
"The industrial designer must be many things and wear many hats," Mr. Grae continues, "and he must provide the vehicle to transport planning into product design and merchandising, yielding profit for the corporation and service for the customer. He must be a product planner, merchandiser, cost estimator, buyer, shopper, engineer and dreamer."

Added to the task of combining all of these talents, the designer must also be a "crystal-ball gazer" because he has to work on plans far ahead. The time-table involved in bringing a design to completion varies, but the average span is about a year. In the case of a design which is new and radical and requires research, it is usually longer, and much depends on the tooling cycles involved in production.

"The creative mind is like a reservoir," says Mr. Grae. "You've got to keep filling it with ideas so that when you draw on it something will come out. Whatever suggests the original idea is usually submerged by the time it has been applied in a design. Each design must be refined over and over before it is finally perfected."

Mr. Grae believes that ideas just sort of grow. He adds: "One thing suggests another. You build ideas from other ideas, usually starting with one conception and winding up with an entirely different one. I can see a foreign car or go to an art gallery or look through a magazine and something will suggest itself. What it turns out to be won't even faintly resemble the thing that inspired it.

"We watch the furniture trends closely. We shop and compare the products of competitors. You've got to



Bernard Grae says designer must be "product planner, mechandiser, cost estimator, buyer, shopper engineer and dreamer."

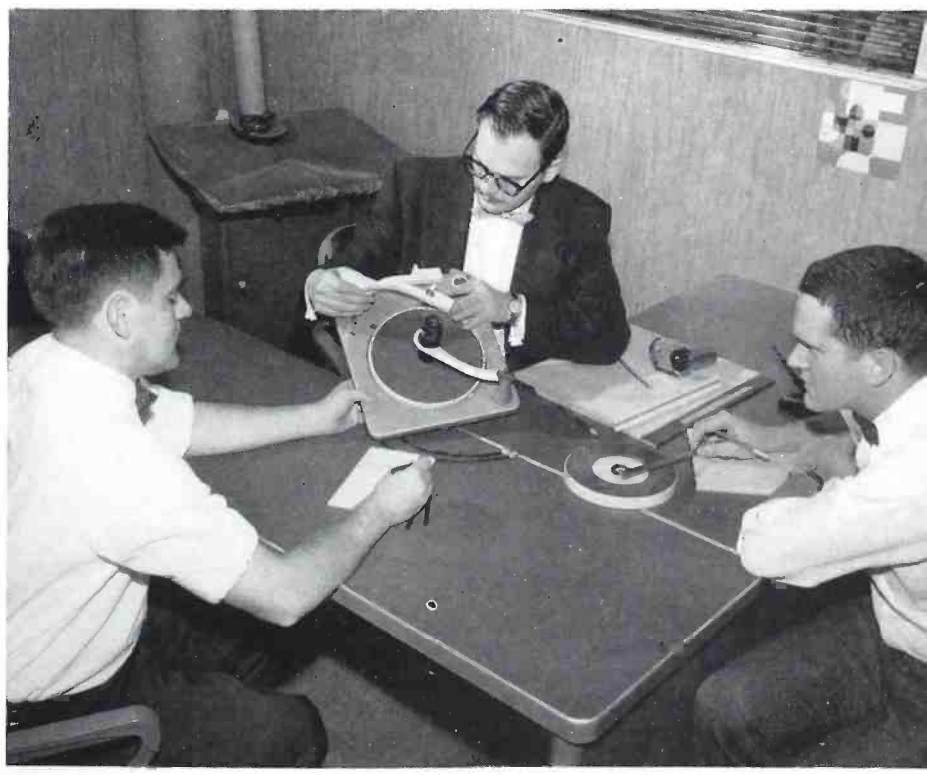
Ideas, say designers, "just sort of grow." Inspiration for new product designs can come from any source: art galleries, automobiles, furniture, magazine layouts.

keep moving, looking, reading, comparing all the time. The inside designer can't afford to just sit. He goes stale. Sometimes a designer who has been working on one type of product for a long time simply runs out of ideas. If he is switched to another product, however, he will come up with a batch of fresh ones.

"Some of the new, radical but beautiful ideas on our drawing boards will take years to be accepted but we can afford to be patient," Mr. Grae says. He goes on to cite many examples of TV set design which met with great enthusiasm from every quarter when they were designed, particularly from home fashion experts and decorators. But the housewife wouldn't buy them.

"The public dictates what it wants by *not* buying what it doesn't want," affirms Mr. Grae. "We've tried a lot of advanced ideas from time to time; some have paid off and some haven't. When you think of the cost involved in changing the tooling and machinery for a radical new design, millions of dollars may be involved."

There may be a certain amount of heartbreak involved when the customer snubs a favored design, but as Mr. Grae points out, "The industrial designer who has the confidence of his company behind him can afford to be patient. Good designs usually find their way into consumers' homes."



About a year elapses between the time an idea is put on paper until a finished product emerges.

# Briefly Told . .

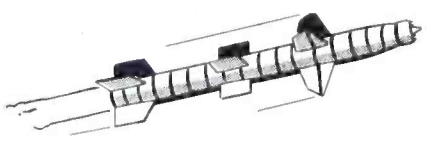
*3rd Birthday for "Monitor" . . .*

NBC Radio's "Monitor" was so busy it hardly noticed its own third birthday. June 15, 1958, was like any other day in this hustling program's schedule, which since 1955 has been on a global trek to provide its listeners with the sounds of foreign places and peoples.

Third anniversary broadcasts included interviews with Yul Brynner in Germany, Bette Davis in Spain and Anita Ekberg in London.

"Monitor" has almost 100 reporters located in all parts of the world, poised to cover fast-breaking news events with all the vast facilities at NBC News' command. By June 15 it had completed 4,840 hours of broadcasting. Programs had featured 12,500 celebrities and 38,000 pickups from locations as wide apart as the Antarctic continent and the Arctic ocean.

*Certificate of Merit . . .*



The highest civilian honor the United States Navy can bestow, the Certificate of Merit, was presented to RCA on June 17 for "outstanding service" in guided missile development and technology.

The award gives recognition to RCA for its development of the Talos Defense Unit, which was designed and built at the White Sands Missile Range in New Mexico by the RCA Missile and Surface Radar Department under Navy coordination.

The newly-created award was presented to Dr. E. W. Engstrom, Senior Executive Vice President of RCA, by Rear Admiral John Quinn, Deputy Chief, Navy Bureau of Ordnance, in a ceremony at the Moorestown plant of the Missile and Surface Radar Department, RCA Defense Electronic Products.

*Color TV in Poznan . . .*

The Russians now claim that they invented color TV back in the 18th century. But RCA has beaten them to the punch in putting on live color demonstrations behind the "Iron Curtain."

RCA color television was demonstrated for the first time in Communist-dominated Poland at the Polish International Trade Fair last month in Poznan.

The same exhibit will be shown to Yugoslavs at the International Trade Fair in Zagreb during September.

Color TV in Russia? According to NBC News Correspondent Irving R. Levine in Moscow, the Russians now say that the basic principles for color television were dreamed up by Comrade Mikhail Romanosov back in the 1700's. After 300 years, Levine said, experimental color transmission is expected to begin in Russia "soon."

*Educational Electronics . . .*

A new department of RCA, Educational Electronics, has been established to implement a broad educational program, utilizing a wide range of RCA-produced "educational tools," such as closed-circuit television, sound, tape, film and other types of recordings.

Announcement of the department was made by President John L. Burns at RCA's 39th annual meeting of shareholders on May 6.

Electronic highway system at RCA Laboratories warns drivers to slow down.

*"Slower Please" . . .*

Absent-minded motorists who drive into the grounds of the David Sarnoff Research Center of RCA, Princeton, N. J., at fifty miles an hour are now electronically (and politely) told to slow down.

A segment of the "electronic highway of tomorrow," which was demonstrated last year at Lincoln, Nebraska in cooperation with the Nebraska Department of Roads, went into operation on May 1 at the research center.

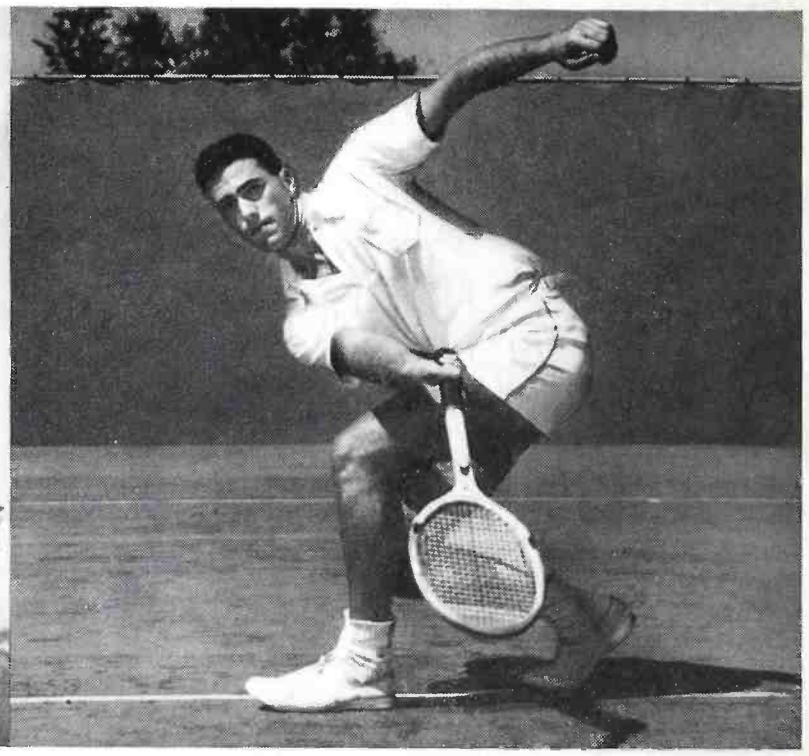
Automobiles entering the laboratory grounds pass over electronic loops buried in the pavement. Transistorized detector units connected to the loops count each of the passing cars, measure their speed, and if the vehicle is exceeding the posted speed limit, flash a warning saying "Slower Please," on a sign twenty yards ahead of the car.

The equipment is a transistorized version of the system installed in Nebraska, which was described in an article in the January 1958 issue of ELECTRONIC AGE.

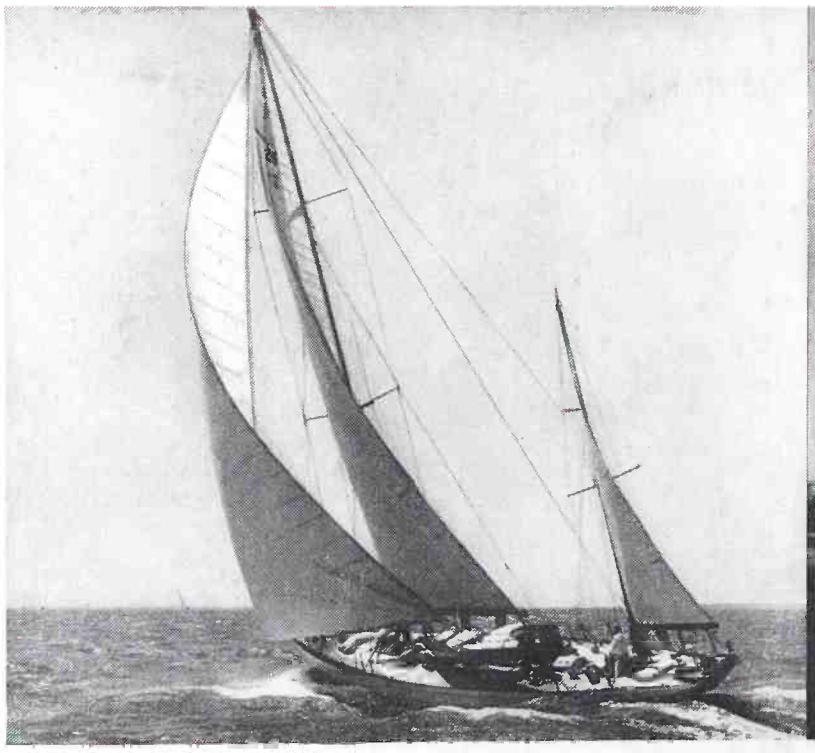
The electronic vehicle control system was developed by an RCA Laboratories research team under the direction of Dr. Vladimir K. Zworykin, Honorary Vice President of RCA.

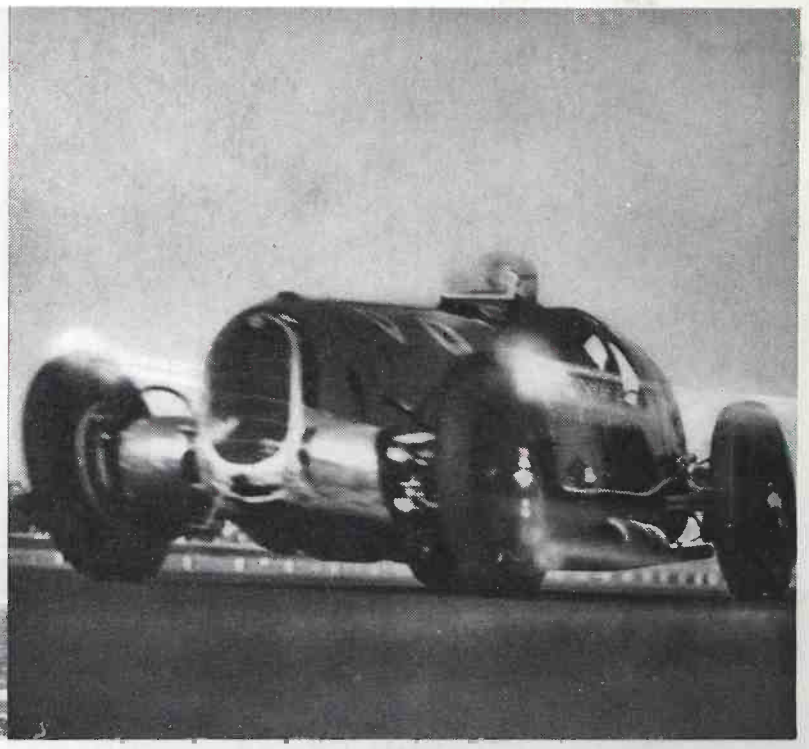
ALL AMERICA SALUTES Van Cliburn

CLEARLY, THIS YOUTHFUL ARTIST BELONGS TO THE GREAT TRADITION OF PIANO VIRTUOSI. WE ARE PROUD INDEED THAT CLIBURN RECORDS EXCLUSIVELY FOR RCA VICTOR.



# MONITOR





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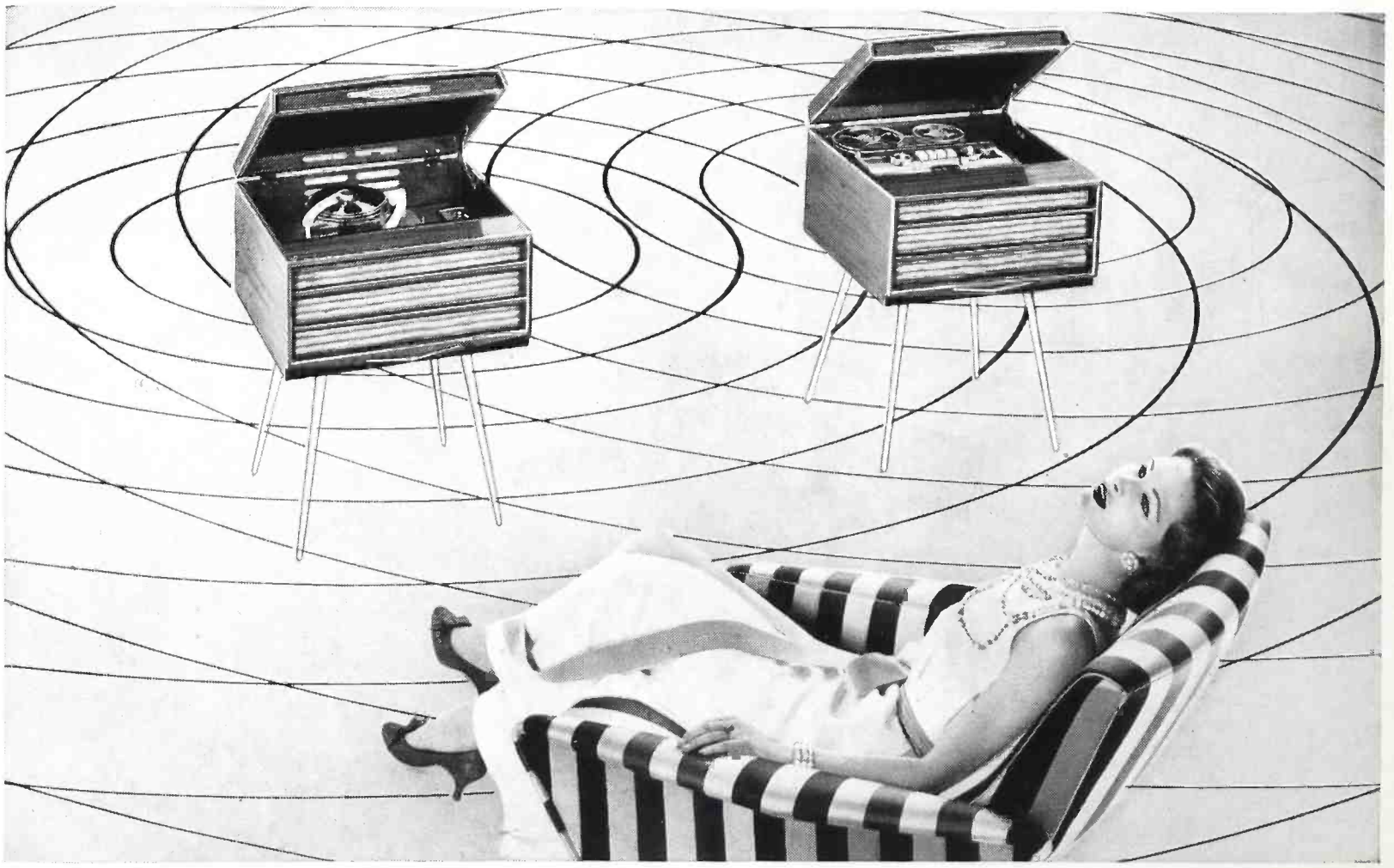
# RCA Victor announces world's first family of High Fidelity designed for Stereophonic Sound you can add now or later!

**Today—buy a New Orthophonic High Fidelity "Victrola"® . . . Now or later—add Stereophonic Sound-on-tape and monaural tape recorder**



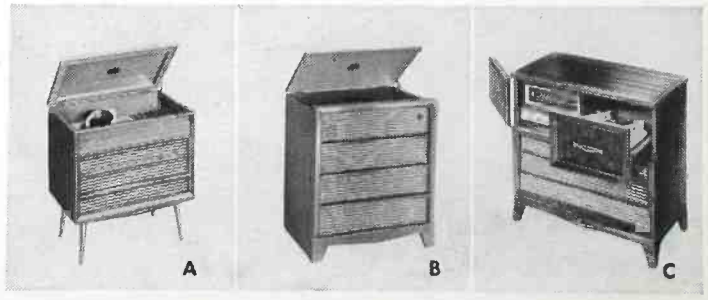
**Above: The Mark IX**—powerful 3-speaker High Fidelity (SHF8) in mahogany finish **$139.95**—shown with matching stereophonic unit, the Recorder-"Victrola" Stereotape Player, Model STR6.

Today you can enjoy two kinds of fine recorded music at home: high fidelity on records, and stereophonic sound-on-tape. Here's how RCA Victor brings you *both:*

**(1) High Fidelity** "Victrolas" by RCA Victor are beautiful—each a laboratory-balanced system—ready to plug in and play. Each brings you 3- or 4-speaker Panoramic Sound, powered by a Supercharged Chassis.

**(2) Stereophonic Sound**—*add it now or later!* This is what it is: music is recorded with *two* microphones on *double-track* high fidelity tape. Instruments at the left are picked up more strongly on one track; instruments at the right are picked up more strongly on the other. You play this tape back through *two* speaker systems. One is in your "Victrola," the other in your Stereotape Player. You hear a *true* re-creation of the original.

Your Stereotape Player also has a built-in, single-track tape recorder. See all the new RCA Victor High Fidelity "Victrolas" at your dealer's today.




**A: Mark VI.** 3 speakers. 4-speed "Victrola." Mahogany, oak, maple, or natural walnut finishes. (SHF6) **$189.95. B: Mark IV.** 4 speakers. Jack for AM-FM tuner. Natural walnut, mahogany, maple, oak finishes. (SHF5) **$229.95. C: Mark III.** 4 speakers. 4 speeds. AM-FM. Mahogany, maple, oak finishes. (SHF3) **$375.**

RCA VICTOR
Trade(s) ® RADIO CORPORATION OF AMERICA

Manufacturer's nationally advertised list prices shown, subject to change. Slightly higher far West and South. Prices are far mahogany finishes, other finishes available slightly higher. Most models also available in Canada. ®RCA trademark for record and tape players.

JANUARY 1958
VOLUME 17
NUMBER 1

# Electronic Age

RESEARCH · MANUFACTURING · COMMUNICATIONS · BROADCASTING · TELEVISION

## COVER

The Brandywine, one of RCA Victor's Mark Series color television receivers, features orthophonic high fidelity sound.

## NOTICE

When requesting a change in mailing address please include the code letters and numbers which appear with the stencilled address on the envelope.

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Printed in U. S. A.

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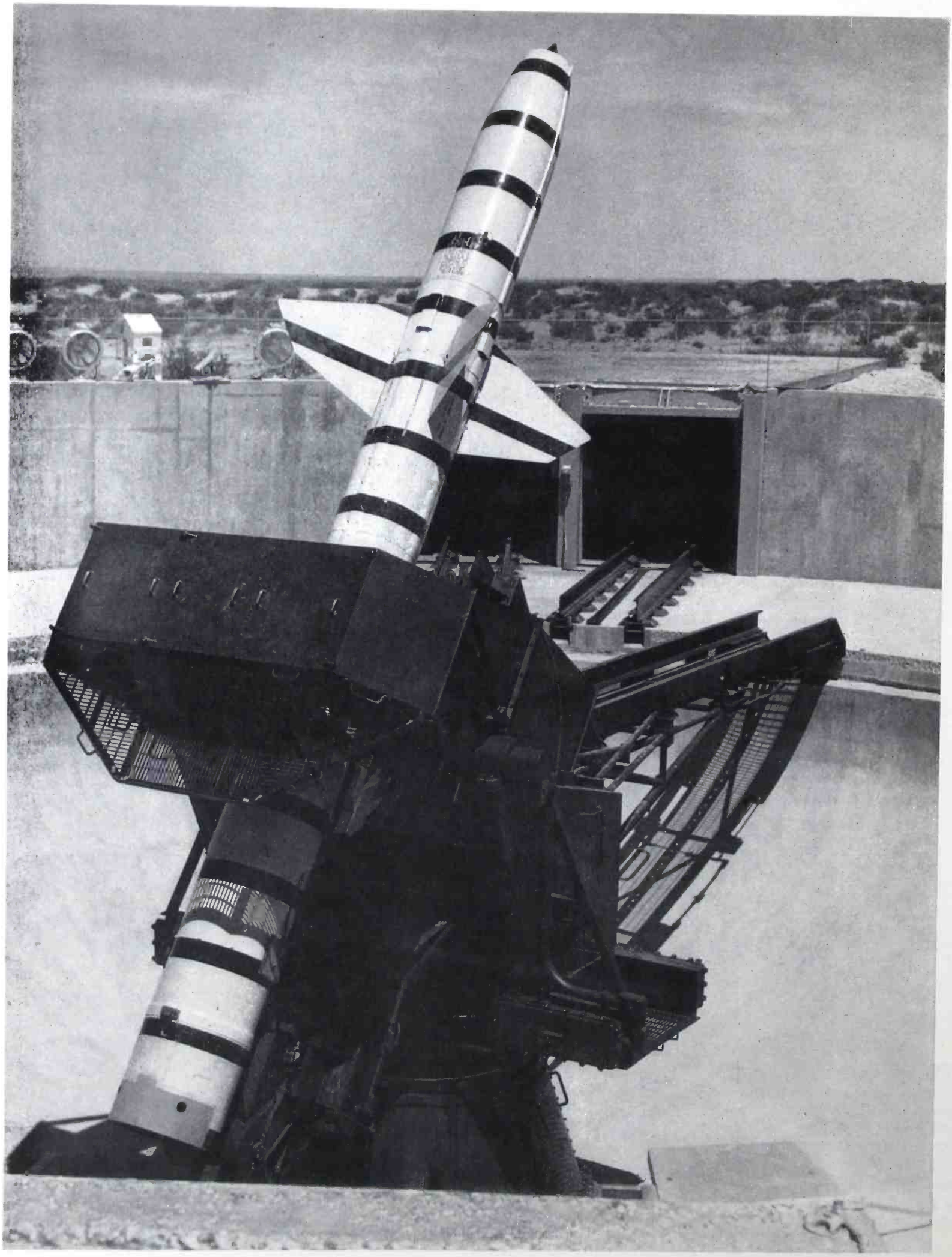


Talos missile is ready for launching from Talos Defense Unit, built by RCA at White Sands, New Mexico. It is first fully automatic base for launching and guiding missiles to aerial targets. See story, page 10.

# SARNOFF SAYS ELECTRONICS INDUSTRY READY FOR SPACE AGE CHALLENGE

## Year-End Statement of RCA Chairman Reviews 1957 Advances and 1958 Outlook—RCA Business Volume Exceeds Billion Dollars for Third Consecutive Year

THE American electronics industry is "equipped and ready" to meet the challenge of the Space Age, Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, declared in a year-end statement.

"We believe that today America leads the world in electronic research and engineering — in new materials, components and systems," General Sarnoff said.

"America also holds the No. 1 position in the production of electronic goods for industry — computers, controls, communications and automated devices.

"With earth satellites and missiles now realities, electronics and technology of space propulsion form the keystone of our defense structure. The task before us is to retain our leadership in electronics and certain other fields of technology and to regain leadership in those fields where the advantage may have been temporarily lost."

### Financial Review — And Outlook

General Sarnoff reported that for the third consecutive year, business volume of RCA exceeded the billion-dollar mark, reaching an estimated $1,180,000,000. This represents an increase of about 5 per cent over 1956.

"While profits earned in the first nine months of 1957 showed a small increase over the prior year," General Sarnoff said, "the softening of general economic conditions in the fourth quarter and the highly competitive situation in the radio-TV industry now indicate that profits for the full year will be slightly below 1956."

Dividends to stockholders declared for 1957 amounted to $23,917,000 (preferred $3,153,000; common $20,764,000). This equals $1.50 per share on the approximately 14,000,000 common shares outstanding.

"Based on present indications," said the RCA Chairman, "we believe that in 1958 the total volume of business in the electronics industry will exceed the 1957 volume."

Government business accounted for 23 per cent of RCA's total volume in 1957. The current backlog of Government orders is about $250,000,000. During 1957, the company invested approximately $35,000,000 in capital improvements.

### RCA Achievements in 1957

General Sarnoff said RCA continued its leadership in technological research and development in 1957. Among the major accomplishments he listed these:

1. The first fully automatic system to launch and guide missiles to their targets — the Talos Defense Unit — was turned over to the Armed Forces and tested successfully.

2. The first commercial method of recording and transmitting color television programs by means of magnetic tape was demonstrated publicly, and orders have been accepted for delivery in 1958.

3. An experimental electronic highway system was devised by scientists of RCA Laboratories, in cooperation with the state of Nebraska, to increase driving safety. This may lead eventually to full automatic control of highway traffic.

4. A new method was devised to transmit facsimile

The Wentworth, in the new Mark Series line, is one of RCA Victor's popular color receivers.

and-white — a plan that will facilitate program schedule regularity in every section of the country.

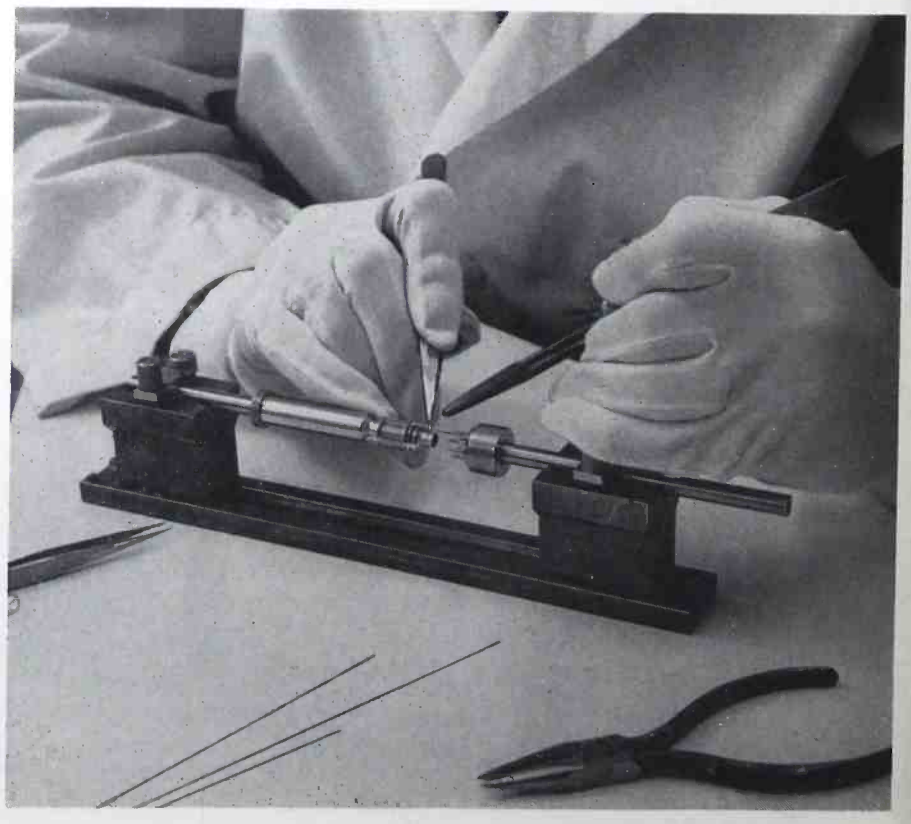
NBC-TV entered the fall season with an exciting schedule in which better than half the regular nighttime presentations consisted of new programs, he said. In addition, the network scheduled more than 100 "specials," the largest number ever undertaken in a single season. Color programming was expanded 67 per cent above the previous fall season to provide at least one hour of color every day and as much as 4½ hours on some days.

### Color Television

The RCA Chairman said that during the year, there was significant improvement in the quality of both transmission and reception of color television to a point where the color picture received in the home now exceeds the expectation of even color's strongest advocates.

"The public bought more color receivers under the stimulus of increased programming, improved quality, and nation-wide 'Carnival of Color' promotions," he said. "Starting in Milwaukee, these 'Carnivals of Color' spread to New York, Philadelphia, Detroit, San Francisco and

Skilled hands insert element in base portion of tiny TV Vidicon at RCA's Lancaster, Pa. plant.



by "bouncing" high-frequency radio signals from ionized air particles created by the passage of meteors through the upper atmosphere. An experimental system was used to transmit still images nearly 1,000 miles without relays.

5. A new ultramagnifier which quadruples the enlarging power of RCA's electron microscope was developed and will be put into commercial production early in 1958. It increases direct magnification from 50,000 to 200,000 times, and photo-enlargement capability from 300,000 to more than 1,000,000 times.

### NBC Progress

General Sarnoff reported that the National Broadcasting Company — a service of RCA — moved forward on all fronts during 1957, capturing a larger share of the viewing and listening audience and increasing its business volume over 1956. He said it was the first network to announce plans for comprehensive use of magnetic tape television — in both color and black-

other cities. They are currently boosting sales in Baltimore, Washington, Harrisburg, Albany, Buffalo, Atlanta, Cleveland, Minneapolis, Los Angeles, and other prime market areas.

"While the sales of color sets have not as yet attained the desired volume, there is encouraging evidence throughout the country that a mass-market status for color TV is close at hand."

## The Future

General Sarnoff said RCA also made notable progress during the year in electronic systems and devices for industry and science, in consumer products and in defense work.

"The electronics industry," he noted, "has grown in the past quarter century from virtually no place to fifth place among American industries. Its total volume for 1957 is approximately $12 billion. We believe it will be double this amount ten years from now. There are four broad fields in which the industry will expand most rapidly:

"1. *Color Television.* The practical experience we have gained in our pioneering efforts with Color Television to date has confirmed our belief that the future growth of television as a profitable business largely depends on Color. As we see it, this applies not only to the manufacturing and sales end of the TV business but also to the programming and sponsored advertising of TV broadcasting.

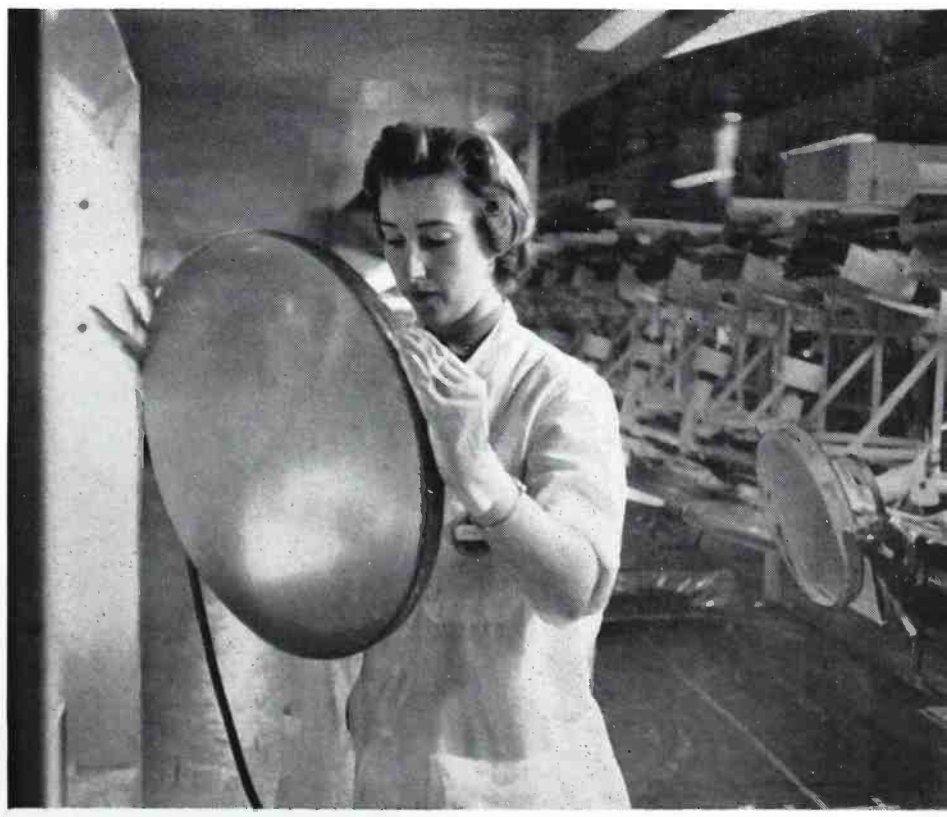
"2. *Automatic Systems.* Versatile electronic systems, applied in the fields of data-processing and computing, communications, and automatic control, are becoming increasingly important in defense as we advance into the age of missiles and space exploration. They are also essential to the operation of our complex industrial processes.

"3. *Electronic Components.* Electron tubes, electronically-active materials, solid-state components, and transistors will be in growing demand as electronic applications expand. These components are the basic building blocks of home entertainment and appliances, broadcasting and communications, and navigation and guidance systems.

"4. *Nuclear Research and Atomic Power.* Electronics supplies instruments and equipment essential to nuclear research and development, as well as the instrumentation and controls needed in applying atomic power to industrial and private use."

The RCA International high fidelity AM-FM short wave radio has five speakers, Magic-Eye tuning.

Face-plates of color TV picture tubes are treated in light- and atmospheric-controlled screening room.



# Color TV Drive Intensifies

## *Upsurge in Sales Results in Areas Exposed to Local Live Colorcasts and Dealer Promotions*

COLOR television sales are moving well in every one of the major markets spotlighted in RCA's intensive drive to achieve mass market sales for color receivers in 1958.

Perhaps the most significant fact to come out of RCA's color campaign to date is the tremendous upsurge in sales of color receivers in areas that are exposed to a regular schedule of local live color telecasts.

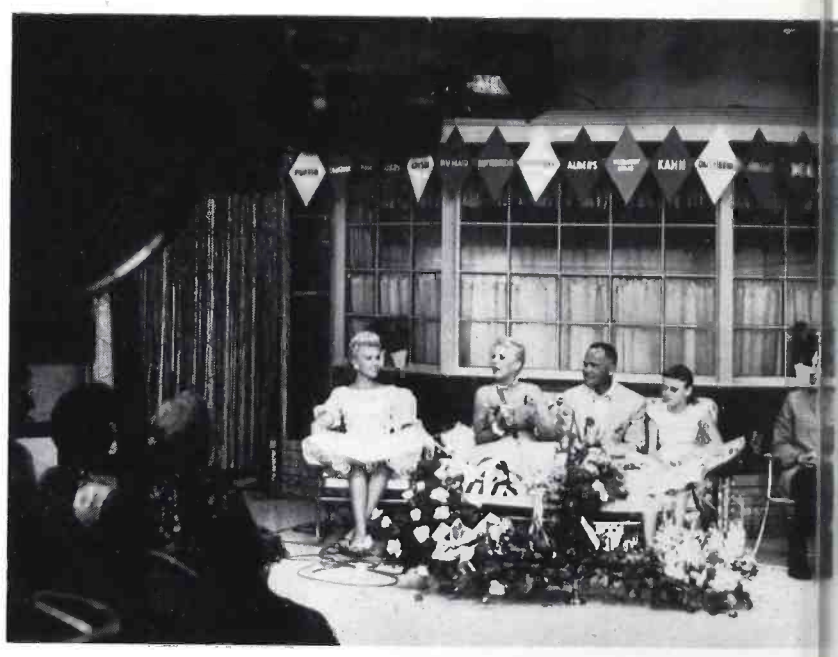
Color sales have been especially outstanding in those cities where live color programming has been supported by enthusiastic dealer and distributor promotions.

In such cities as San Francisco, Omaha, Milwaukee, Cincinnati and Chicago, where aggressive sales campaigns have had the benefit of live color shows, color set sales are soaring.

The excellence of the new Mark series color TV receivers has been of particular importance in the success of the color campaign. Dealers and servicemen, who had been apathetic to color's possibilities, have been won over by the smooth performance of the Mark series.

Not only have these sets proven themselves easy to demonstrate and sell, but servicing has been considerably simplified.

The promotions carried out in 26 markets have all been tailored on the highly successful "Carnival of Color" campaign in Milwaukee last Spring. Techniques developed in that promotion, with local variations, have been applied in cities all over the country.



Ruth Lyons' "50-50 Club" has helped zoom sales of color sets in four-city areas served by WLW stations.

Crosley Broadcasting in Cincinnati works closely with area distributors to increase color sales.

### The Cincinnati Story

One of the most successful promotions in RCA's color drive has taken place in Cincinnati; it is typical of the campaigns underway in other cities.

A cooperative effort on the part of Ohio Appliances, an RCA Victor distributor, and the Cincinnati Gas and Electric Company, together with other major TV distributors in the area, the campaign has sent color TV sales skyrocketing.

Borrowing its theme from a highly successful movie, the month-long Cincinnati campaign was entitled, "Around the World in 80 Minutes — with Television."

Center of this promotion was a display in the lobby of the gas company's building. Designed to show that it is possible to be a globe trotter in the viewer's own living room, the display featured a revolving world, with

the main character in the movie, Phineas Fogg, alongside. Hovering overhead was a huge balloon patterned on the one used in the movie. A TV camera aimed at the globe, gave an instantaneous visual image of television's world-wide coverage.

The acquisition by the Crosley Broadcasting Group of an RCA mobile color broadcasting unit has increased color telecasting in the Cincinnati area by nearly 100%.

In addition to the NBC network shows, Crosley stations regularly broadcast four hours of color shows each day. With network color telecasts this adds up to six to eight hours of daily color programming.

The increased color programming on Crosley stations has resulted in sharp increases in color set sales in the four cities served by the group, Cincinnati, Columbus and Dayton and more recently Indianapolis.

An important part of the Cincinnati promotion was in demonstrations. The public was invited in to see the World Series and the most important of the college football games. In Indianapolis, World Series parties were featured in the ballroom of a downtown hotel.

The "Magic Screen" contest was carried out with the cooperation of the *Cincinnati Post*. The paper printed each day a coupon that entitled visitors to the gas company's display to look into the "Magic Screen." An automatic timing mechanism was set to show either the prize the viewer was to get or, for unlucky ones, only a mirror reflection.

All prize winners were eligible for grand prizes in a lottery drawing. Winners carried off a $500 color TV set, portable hi-fi sets and radios.

In addition to printing the prize coupon, the *Post* published a special section devoted to the campaign, as well as carrying special articles devoted to color television all during the campaign.

WLW was first independent network to originate live color shows, using RCA Mobile Color Unit.

## Other Cities

In Omaha, station KMTV televised in color the Ak-Sar-Ben festival, including the crowning of the King and Queen of this annual state fair.

This was only part of the more than nine hours daily color television programming, network and live, carried on KMTV during the Fall.

The active color promotions carried on in Omaha, together with the televising of live local programs resulted in a more than 100% increase in coler sales.

In Detroit, Saginaw and Minneapolis strong local promotions sent color sales soaring.

WGN-TV in Chicago, one of the first stations to provide local color programming on a regular basis, has now been joined by WNBQ, NBC's own station, giving the city a greatly expanded color telecast service.

In Boston, WHDH recently went on the air with three and a half to four hours of live color shows; WBZ provides NBC's regular network shows in the Boston market.

Dealers in Lansing, Michigan, are gaining big dividends in their guaranteed satisfaction promotion. This is an unconditional pledge to take color sets back if the customer is not 100% satisfied.

## Color TV Demonstrations

One significant part of RCA's massive color campaign is the nationwide effort to expose as many people as possible to color television demonstrations. Since an overwhelming majority of the American people have never even seen a color television show, this facet of the campaign is of cardinal importance.

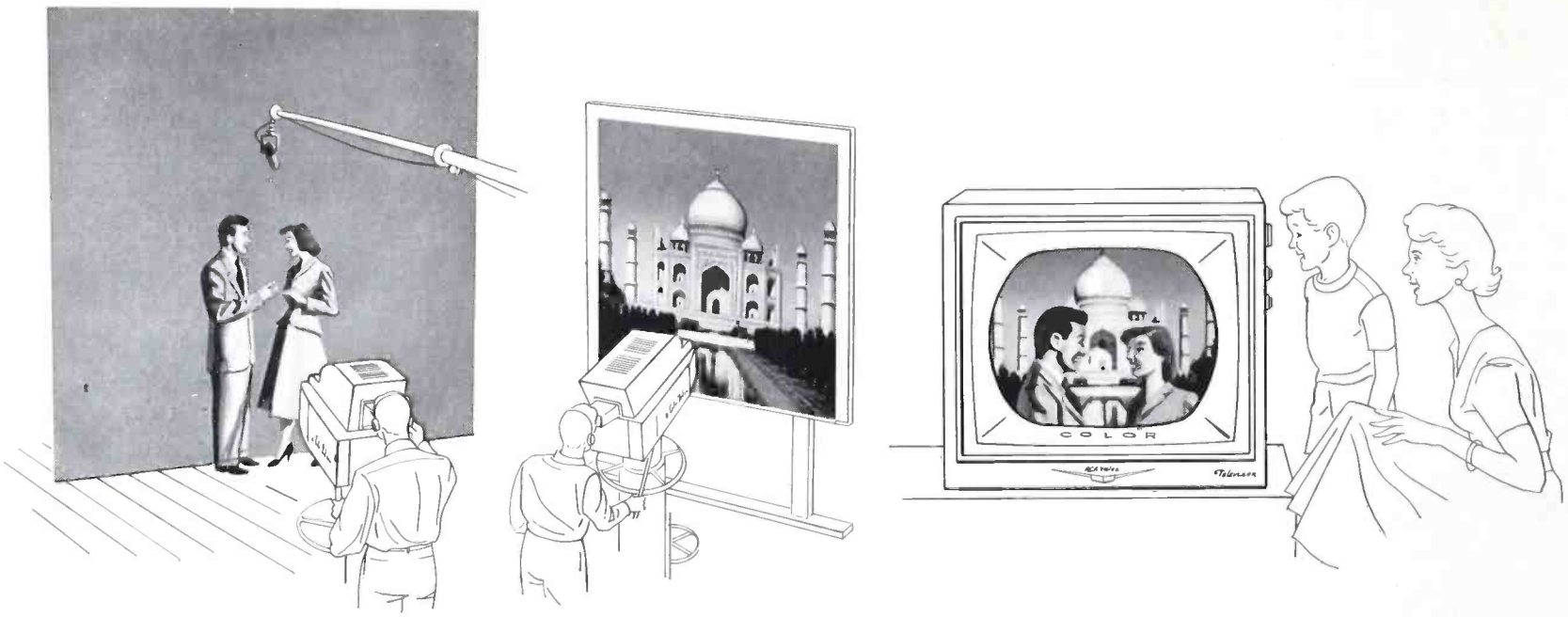
In all of the major markets, color demonstrations have been emphasized. In Cleveland, for example, veterans' and service organizations were loaned color television sets for the Army-Navy football game.

Notre Dame clubs throughout the country have been furnished color sets for outstanding games in which the Irish played.

In the Bergen-Mall area of New Jersey, a closed circuit color television presentation was arranged with Allied Stores; in the first weeks this demonstration of color television, which included fashion shows, drew over 20,000 spectators.

In the Cincinnati campaign over 200,000 people were exposed to the advantages of color television through special promotional color TV presentations.

An all-out national promotion of the 700 series will place heavy emphasis in 1958 on dealer trade-in plans and home demonstrations. Dealer advertising will concentrate on this type of promotion; intensified campaigns will be carried in newspapers, and on local radio and television stations.




In productions employing the "Chroma-Key" process the action takes place in front of a blue background screen. The setting in which the audience will see the play is fed into the special effects amplifier either directly or from a second camera. The two effects are integrated in the amplifier and go out over the air as a composite picture.

# STUDIO: THE WORLD

## NBC Introduces "Chroma-Key" to extend scope of TV settings

It is two minutes until "curtain" time. One of the season's most-talked-about television plays is about to begin unfolding "live" and in color in the nation's living rooms.

The actors have taken their places on stage, waiting for the opening cue. It is a strange stage, for it is practically bare of scenery, props, furniture and all the other usual essentials of any well-done play setting. Bare, that is, except for its background screen and floor, both in a distinctive shade of blue.

One minute to go. In sixty seconds these players will be acting out their story on the empty stage.

But once the play flashes onto television screens across the country a "miracle" seemingly occurs. For these actors are seen in elaborate stage settings or perhaps in foreign cities or scenes.

The miracle is NBC's "Chroma-Key," or color key electronic inset, process.

The actors in our play will be seen, perhaps, sitting at sidewalk cafes along the Champs Elysees, or strolling in the Rue de la Paix, or seated in an Alpine lodge. Soon the scene will change and they may act out a sequence of the play in St. James Park, London, or in Piccadilly. The picture fades and suddenly we will be in New York, or Buenos Aires, or for that matter, in Tokyo or Timbuktu.

Due to "Chroma-Key," studios in Manhattan and Color City, California, have, in effect, suddenly expanded to take in the entire world. Any scene or location anywhere on the globe is now at the almost instant disposal of TV writers and directors. Enlivened studio walls now give real meaning to Shakespeare's immortal phrase, "all the World's a stage."

The "Chroma-Key" process and apparatus was developed by RCA engineers working with patents granted to Dr. Alfred N. Goldsmith, RCA electronics pioneer and consultant.

Video insertion has been employed in black-and-white television in which the keying signal was derived by the difference in brightness of the person to be inserted from the background, which is usually jet black and arranged to reflect no light. This same technique was used successfully in color television on a number of programs, and it was suggested by Frank Gaskins, NBC Technical Supervisor, West Coast, that advantage should be taken of this technique to permit improved results in the use of color difference between the subject to be inserted and the background.

Work in this field is being conducted by Mr. Gaskins, Robert Pierce, Milton Altman and Henry Ball, of NBC West Coast operations, and by Ralph C. Kennedy, of NBC Engineering Development, under the direction of George M. Nixon. They have led the way to technical development of electronic composites techniques for

operational use in color programs. Within the past year "Chroma-Key" has been used on an increasing number of top shows, including those of Steve Allen, Julius La Rosa, and George Gobel.

The process involves the insertion of subjects (for instance, actors in a play) into a previously chosen setting, (such as location films, or still photographs).

The action in front of the screen is picked up by a regular television camera and fed into a special effects amplifier. Simultaneously, the "setting" or background material is also played into the amplifier, either directly or from a second camera. There the two effects are integrated and go out over the air as a completed picture.

The video signals transmitted in the live action wipe out and annul the signals of the filmed setting. In other words, the space occupied by the actors' bodies will blot out the background signals for that specific space. Likewise, the signals of the filmed background will blot out the blue screen before which the actors perform.

## Special Effects Amplifier

A switching signal, or color key, used in association with the special effects amplifier controls the signals sent out over the air. The switching signal is in turn created by the camera photographing the live action in front of the blue screen. While the camera is scanning the blue screen the switching device automatically activates the second camera, which projects the background. When the scanning signal reaches that area covered by the live actors, the switching device turns off the camera projecting background material and transmits the action.

One restriction on the actors is that they must be careful not to wear clothing the color of the screen; in this case the switching device would automatically key in the background. For instance, if an actor wore a blue tie he would appear to have a hole through his body with the background showing through.

For a more realistic effect, a third element can be introduced. This may be a film clip showing objects in the immediate foreground, such as pedestrians or moving traffic, in front of both the live action in the middleground and the background. The signals from the foreground picture will obscure both the background and middleground live action signals; the pedestrians in the second (or foreground) film clip will be seen walking in front of the subjects (the actors) and the background.

Fitting the various elements into a finished scene can be likened to an electronic jig-saw puzzle. Extreme care must be taken to see that the lighting and perspectives in these elements match one another. And their outlines and boundaries must be in accurate contact.

Matching perspectives is all-important where live action is to be inserted within miniature sets or models. A longer focal length lens will magnify the model to correspond to the size of the actors. Or, a wide angle or short focal length lens will reduce the actors to the size of the model.

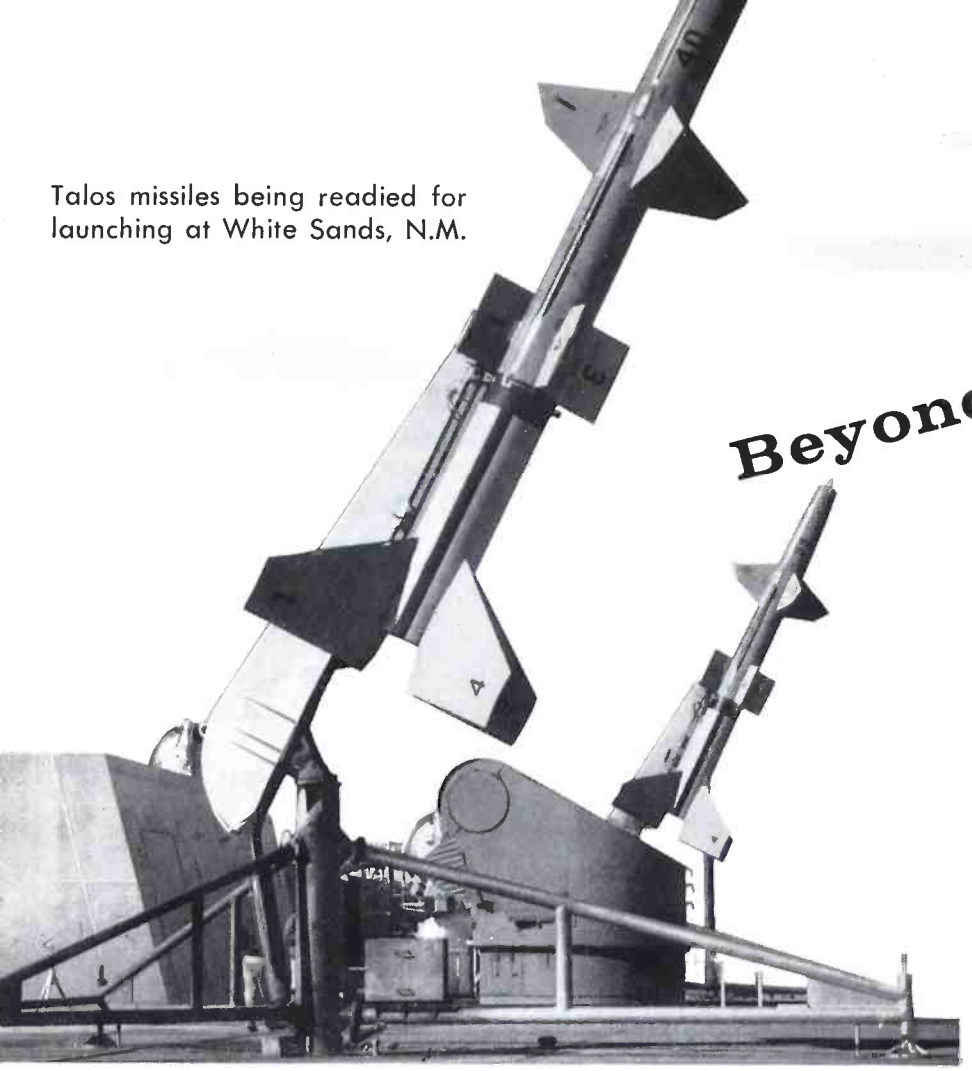
The background screen before which the action takes place is completely blotted out and eliminated by the chosen film or slide surroundings. The color of the screen must complement the predominant hue of the inserted subject matter. In action involving human beings, a blue screen is used because blue most nearly complements the strong red component of flesh tones. In other words, the screen must be at the opposite side of the color scale from the subjects to be inserted for best results.

The basic patents covering electronic composites and various special effects in monochrome television (which with modifications can be applied to color television) were taken out by Dr. Goldsmith between 1929 and 1939. Dr. Goldsmith's aim was to give television, then in its early developmental stage, the same freedom of scope, locale, and flexibility enjoyed by motion pictures. The movie industry had perfected by optical means such techniques as the split screen, where two separate pictures are shown side by side within the same frame; the inset, where one picture is inserted within another; and the fade-out, fade-in, or lap dissolve, where one picture gradually dims out to be replaced by another.

The processes developed by Dr. Goldsmith permitted

*(Continued on page 30)*

Filmed background scenes from anywhere in the world, such as this Parisian sidewalk cafe, can instantly be inserted into live plays with no break in continuity.



Talos missiles being readied for launching at White Sands, N.M.

# Beyond Push-Button Warfare

A NEW ERA in the history of military electronics and automation has been ushered in with the completion of the Talos Defense Unit — the first fully-automatic weapons system for firing and controlling guided missiles.

Designed, developed and built by RCA's Missile and Surface Radar Department, Defense Electronic Products, at White Sands, N. M., Proving Ground, the Talos Defense Unit is a high firepower automatic system employing some of the most advanced engineering techniques now in use.

A successful firing of a Talos missile from the new unit was carried out on December 13. Target in this evaluation test was a B-17 drone, flying at medium altitude far down range. The officer in charge announced that the intercept was "completely successful."

Speaking at the dedication ceremonies for TDU on October 15, when the unit was turned over to the Army for evaluation, Dr. Elmer W. Engstrom, RCA Senior Executive Vice President, said that "this goes one step beyond push-button warfare, for at the Talos Defense Unit you don't even need to push a button to send this weapon into action."

Dr. Elmer W. Engstrom, RCA Senior Exec. Vice President, speaking at dedication of Talos Defense Unit.

## Surface-to-Air

Engineered to control the 3,000 pound Talos, developed by the Navy, the TDU is a land-based automatic defense surface-to-air weapon system. It is designed to throw up a ring of powerful, accurate missile defenses around both military bases and industrial centers, guarding against both subsonic and supersonic air threats.

The Talos Defense Unit program came into existence in 1954, due to the advanced development status of the Talos missile. The Navy, in conjunction with the Applied Physics Laboratory of the Johns Hopkins University, had been working on the Talos missile program since the end of World War II. The Navy Bureau of Ordnance was designated to develop Talos as a land-based, surface-to-air missile.

The work was tackled under RCA's Weapons System project approach. This assured the company of complete,

Elaborate test equipment keeps tabs on all phases of TDU. Unit can tackle many targets simultaneously.

overall charge of the project, from planning to completion. Every phase of the installation was supervised by an RCA project management team, coordinating the work of both RCA technical personnel and the contributions of the subcontractors. Principal subcontractor was American Machine & Foundry Co., who developed and produced the automatic missile launcher.

## How It Works

In case a fleet of enemy bombers, or perhaps a single missile, is detected by one of the numerous warning systems spanning the North American continent a signal is sent to the TDU. It is received by a series of data-handling and computing machines which decode the information and analyze the number of attackers, their location, course and speed of approach.

A scheduling and programming computer sets the logical points of interception. It then activates machinery to load the missiles onto launchers and fire them at the proper time and in the proper direction.

At this stage — still without the lifting of a human hand — the blast-proof concrete-and-steel cell doors swing open to release the missiles the computer has selected.

As a cell is opened, one of the launchers circles to face it and sends a small cart down a railed bridge to the door. Swiftly the missile is loaded on the cart and rolled onto the launcher.

The launcher then swings to the desired position of fire. After an automatic check-out — and at the proper time — the projectile is fired.

There are two stages of flight after the initial upward thrust. First, the missile follows a guidance beam to the vicinity of the target. This is a version of RCA's precision, long-range, high-power instrumentation radar which has been tested by the U. S. Bureau of Standards and found to be the most accurate radar in existence. Second, as the missile approaches the target, a secret "homing" device senses its presence and "locks on" to the target to close in for the kill.

Operators can easily observe and monitor each engagement. The main fire control console shows a continuous picture of the status of a multitude of engagements simultaneously. A three-color (blue, red, green) video display screen, based on RCA's techniques of commercial color television, provides a graphic display.

## Operating Highlights

1. *Coverage:* The Talos range is sufficient so that each Defense Unit around a city or military base can engage a threat from any direction. With this range, along with its high and low altitude capabilities, Talos gives the greatest coverage of any local defense system in existence.

2. *Firepower:* TDU uses early warning information from radar networks and other sources for midcourse guidance. Time-sharing of major components of the system, referred to as multiplexing, makes it possible for a single Talos Defense Unit to engage various targets simultaneously with many missiles in the air at the same time.

3. *Kill Probability:* High overall system accuracy and warhead lethality (either high explosive or nuclear) assure high kill probability.

4. *Accuracy:* Precision, high-power, long-range radars, electronic computers, programmed missiles guidance techniques and a precision missile homing seeker assure extremely high accuracy at short and long ranges and high and low altitudes.

5. *Reliability:* By use of highly-reliable components, redundancy, multiple data channels and automatic fault by-pass features, high reliability is assured. In case of component failure, system operation continues by by-passing that component.

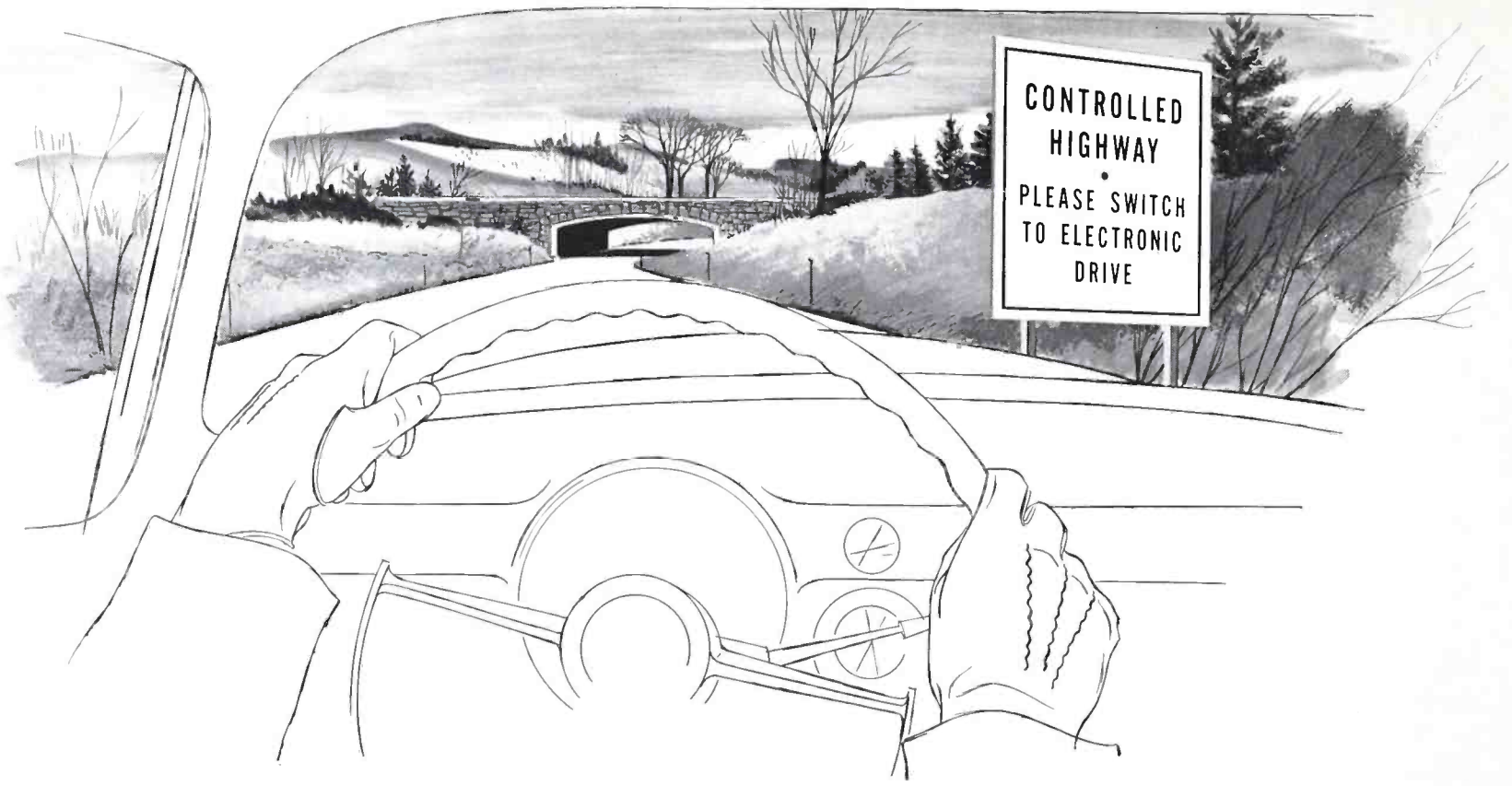
6. *Self-Checking, Ease of Maintenance:* Automatic system checkout equipment is built into the Talos Defense Unit, providing system check-out in a few minutes. Should trouble exist, it is quickly isolated and corrected by replaceable plug-in modules.

7. *Personnel Training:* Built-in equipment feeds in various problems on tape and simulates actual engagements, providing a method of maintaining a high state of personnel training and overall combat effectiveness.

The Talos missile is about 20 feet long, 30 inches in diameter and weighs 3,000 pounds. It is accelerated by a large solid fuel booster rocket some 10 feet long, which is jettisoned when the missile reaches cruising speed. At this point the main ramjet engine, using kerosene as fuel, ignites and provides thrust to keep the missile at constant speed throughout its flight. The engine develops 40,000 horsepower.

The Talos Defense Unit is composed of three structures, one a long, low concrete and steel building containing the control center, and the other two circular magazines with the launchers, resembling anti-aircraft guns, in the center and numerous cells on the perimeter to house the missiles themselves. All three are built to withstand the pressures of the missile take-off and near misses from enemy bombs, and all are air filtered for protection of the equipment and personnel.

The basic design of the Talos system provides for extension of capabilities with a minimum of modification to assure that the system will have continued effectiveness against present and future hostile air threats.




# HIGHWAY OF THE FUTURE

PASSING the above sign as you enter the super-highway, you reach over to your dashboard and push the button marked "Electronic Drive." Selecting your lane, you settle back to enjoy the ride as your car adjusts itself to the prescribed speed. You may prefer to read or carry on a conversation with your passengers—or even to catch up on your office work. It makes no difference for the next several hundred miles as far as the driving is concerned.

Fantastic? Not at all. The first long step toward this automatic highway of the future was successfully illustrated by RCA and the State of Nebraska on October 10, 1957, on a 400-foot strip of public highway on the outskirts of Lincoln.

Both unequipped vehicles and a test car with special receiving equipment were used to show the immediate uses and the ultimate possibilities of electronic highway control.

Coupled to a series of RCA experimental detector circuits buried in the pavement were a series of lights along the edge of the road. In the test car were special RCA radio receivers and audible and visual warning devices to simulate automatic steering and brake controls.

In a series of tests, the installation at Lincoln proved its ability to:

- Provide automatic warning to a driver following too closely behind another vehicle,
- Indicate to a driver the presence of a parked vehicle or other obstacle in the highway ahead,
- Guide a car accurately along its traffic lane even under conditions of zero visibility for the driver,
- Cause remote operation of warning lights ahead at points of merging traffic, or along the roadside for any distance ahead of or behind a moving vehicle unequipped with special equipment.

The demonstration, observed by nearly 100 state and federal highway Officials, representatives of automobile manufacturers, and the press, made two major points. First, was the fact that the various elements of the system can be used immediately in conjunction with arrays of roadside and intersection lights to increase driving safety under present conditions, without requiring special equipment on cars or trucks.

Second, was the clear indication that the system as a whole can be developed without major technical complications into a fully automatic highway traffic control system.

## Driving in the Future

Operating the system of the future will be as simple as it seems fantastic. From beneath the pavement, electrical signals will radiate from buried wires to be picked up by the tiny transistorized receivers built into the car. On one frequency will come the signals from the guidance cable, controlling the power steering mechanism to keep the car in its lane.

Signals on another frequency will warn of obstructions in the highway half-a-mile or a mile ahead — per-

haps a stalled vehicle, or a highway maintenance crew at work. Whatever the cause, signals, picked up by another receiver in the car, will operate automatic controls that reduce your speed by letting up the accelerator, apply the power brakes, or guide the car automatically into the next lane to pass the obstruction.

Operating on a third frequency, the special highway receiver on the dashboard will pick up signals from a buried antenna and cut off the standard car radio to make an announcement of its own: "Exit Number Three for Pittsburgh area is five miles ahead. Connections at this exit with Routes 19 and 28. Please watch roadside signs for further directions."

Approaching the exit the radio will again cut in with an announcement supplementing the roadside signs. "Exit Number Three for Pittsburgh area is two mile ahead. Motorist for Exit Three please switch off electronic drive and move to exit lane at extreme right." The motorist will simply push a button to switch the car to manual control. He will then move into the right lane to approach the exit and turn off the superhighway.

## How It Came About

Behind the Lincoln demonstration, and the further developments that are likely to come from it, is a story of imagination and enterprise in two widely separated locations. One is RCA's David Sarnoff Research Center in Princeton, N. J. The other is the State Capitol building at Lincoln, Nebraska.

The electronic highway control system is itself the conception and development of an RCA Laboratories' team including Leslie E. Flory, George W. Gray, and Winthrop S. Pike, working under the direction of Dr. Vladimir K. Zworykin, Honorary Vice President of RCA. It is based on a concept demonstrated by Dr. Zworykin and his associates at the Center in 1953.

At that time, the principles were successfully applied in a small-scale system in which wires laid in a pattern on the laboratory floor were used to guide and control a miniature car. It was a sufficiently fascinating "toy" to inspire a feature article by writer John Lear in *Collier's* magazine.

The article sparked the imagination of Leland M. Hancock, traffic engineer in the Nebraska Department of Roads, and of his director, L. N. Ress, State Engineer. The decision was made to experiment with various aspects of the system in actual highway installations in the vicinity of Lincoln.

To accomplish their purpose, the Nebraska officials turned to the RCA Laboratories group at Princeton for the novel electronic equipment that was needed.

The opportunity that presented itself was the construction of a new main intersection of U. S. Route 77 and Nebraska Highway 2 on the outskirts of Lincoln. As the pavement was laid, the necessary wiring was buried, preparing the ground for the experimental work, the results of which were demonstrated on October 10.

## How It Works

What the observers saw at the first public demonstration was a system comprising three basic elements:

1) a sequence of detectors installed at intervals slightly greater than car length along the road, capable of reacting to the passage of cars;

Cars with radio receivers run tests on highway equipped with buried detector circuits at Lincoln, Nebraska. RCA scientists are continuing developmental work on system.

2) a radio warning system for following vehicles, controlled by a signal from the detectors;

3) a guidance system to keep each vehicle centered in its lane.

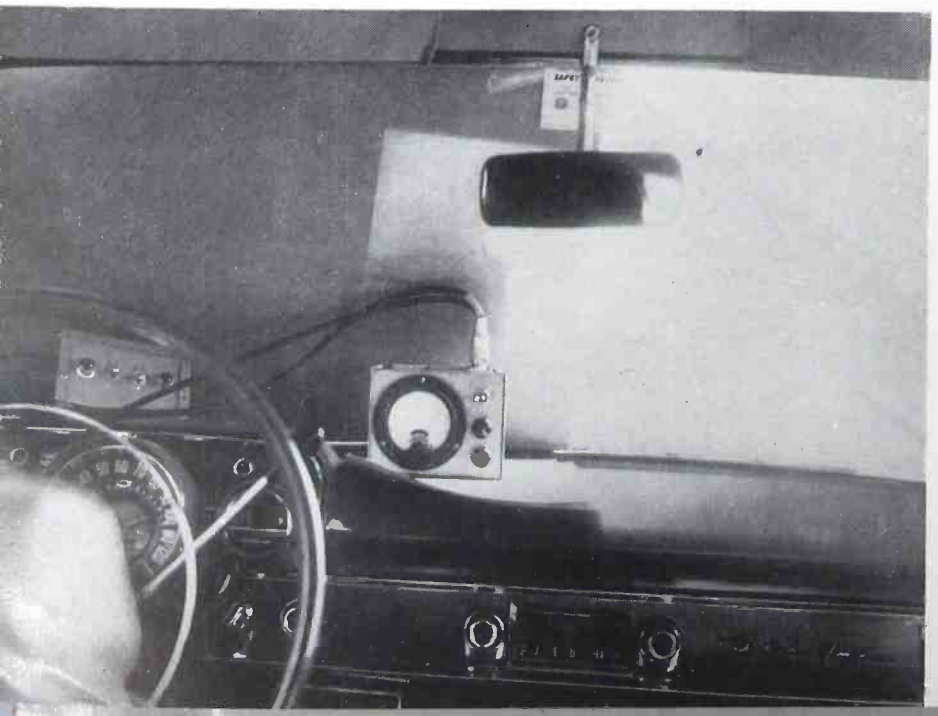
The *detectors* consist of rectangular loops of wire, six by twenty feet, buried in the pavement in the traffic lane, and coupled to an associated circuit at the edge of the road. The loop carries a voltage from a high-frequency power line. Whenever a vehicle passes over the loop, the result is a variation in current which is detected by the roadside circuit. The circuit then produces an output signal that controls an indicating device, such as a warning light, and at the same time switches on the radio warning system for following vehicles.

The *radio warning system* is simply a transistor switch and an antenna that extends back beneath the pavement from each of the detector loops for any desired length. When the detector responds to a passing vehicle, the transistor switch is closed, causing the antenna to radiate a signal.

This continues for a certain interval of time after the vehicle has passed, so that the antenna radiates, in effect, a "radio tail warning" behind cars as they move along the highway. The tail warning signals can be used to actuate warning lights along the side of the road, or they may be picked up by following cars with appropriately tuned receivers that can be used ultimately to activate automatic control of brakes.

The *guidance system* is a cable laid down the center of the traffic lane beneath the pavement, carrying a signal current of yet another radio frequency. To use the continuous signal, a car is equipped with small receiving antennas mounted at either end of the front bumper or on both front fenders. These antennas are connected to a differential receiver which responds when it receives two signals of differing intensities.

Warning devices include left-right indicator (below mirror) and buzzer and warning lights for obstacles such as other vehicles or maintenance crews.



As long as the car is centered over the cable, nothing happens. As soon as the vehicle moves to either side, one signal increases in intensity while the other decreases, causing a response in the receiver. In the demonstration, the effect was shown on a meter in the test car; in the ultimate system, it would be used for automatic control of the steering mechanism.

## A "Compatible" System

Perhaps the most telling point of the demonstration in the eyes of highway experts was the extent to which the electronic system is compatible with present highway conditions, having many applications in the near future without requiring any equipment in cars.

The point was demonstrated simply. As cars entered the test strip, a warning light automatically flashed on over a merging traffic sign 400 feet ahead, alerting drivers approaching on an adjacent road. Then, as each car moved over the buried loops, a light beside each loop was turned on automatically, tracing the passage of the car through the test area.

Dr. Zworykin pointed out that the use of lights along the roadside could provide a visual substitute for the "radio tail warning," serving vehicles without any receiving equipment. In this way, a vehicle moving along in the fog might light a series of lights several hundred feet behind it, warning approaching cars and immediately preventing rear-end collisions in fog banks — a type of accident that has involved as many as thirty cars at one time on the New Jersey Turnpike.

## Introducing System

*First stage:* No auxiliary equipment in vehicles, but systems of warning lights activated by the buried detector units. This could be done immediately, perhaps beginning with isolated portions of the highway system.

*Second stage*: Some cars equipped with signal detectors which would give the driver a dashboard indication of the distance of clear roadway ahead, even under conditions of zero visibility.

*Final stages*: Automatic vehicle control would also be introduced on a step-by-step basis, beginning with installed equipment that would make use of signals from the guidance cable and buried antenna systems to control steering and braking.

Ultimately, automatic control devices would sense suitable opportunities for passing and would change routes in response to a program pre-set on an electronic computer in the vehicle. The driver would have to take over only as he left the high-speed road system.

# RCA's Helpful 'Hams'

By DAY their talk is of electron tubes — tube design, tube sales, and the like — but when they meet after working hours their jargon is embroidered with such terms as "rigs," "QSL cards," "DX" and "QSO's." These are the members of the Amateur Radio Society of Harrison, N. J., with membership drawn mainly from employees of the RCA Electron Tube Division plant in that city.

In the parlance of their hobby, the members of Harrison group are "hams," a fraternity that is active the world over. In the United States alone more than 100,000 radio amateurs man their transmitters and receivers to conduct gabfests — "rag-chewing" in their vernacular — with other hams half way around the globe.

Although the Harrison Club was formed only six months ago, it now has a membership of eighty, including seven women. These members represent a cross section of different departments at the Tube Division. Bob Leedy, who is President of the Society, is technical editor of *Ham Tips* and other house magazines issued by the Advertising and Sales Promotion Department. Fred Barkalow, the Club's Vice President, and John Capo, Treasurer, are both employed in the Equipment Development Section.

The Secretary, Jack McPartland, is in Plant Personnel and the General Manager of the group, Tom Ryan, works in the Receiving Tube Rating Laboratory. Other employees are from various departments of the Division including Purchasing, Chemical Laboratory, Merchandising, Commercial Engineering, Accounting, Microwave Engineering, Plant Administration and Receiving Tube Design Engineering.

One rather special member of the Society is W. Walter Watts, RCA Executive Vice President, Electronic Components. Mr. Watts, a radio amateur for many years, has taken a keen interest in the group since it was organized.

Article I of the Society's Constitution explains that objectives of the club are: ". . . the promotion of interest in amateur radio communication and experimentation; the relaying of messages by radio without charge; the furtherance of public welfare; the advancement of the radio art; the fostering and promotion of intercommunication by electronic means for the personal benefit of members, without pecuniary gain; the fostering of education in the field of electronic communications; and the dissemination of knowledge and information by electronic means."

As part of its activities, the society offers classes to members who are interested in learning code and radio theory which will enable them to pass their examinations for a novice, technician or general class operator's license. The code classes are held Monday through Friday during the lunch period, while theory classes are conducted one evening each week.

So far, twenty-five members have received their licenses from the Federal Communications Commission as a direct result of the club's training program.

A bi-monthly bulletin, written and edited by the club's president, keeps members up-to-date on the society's activities. It publishes highlights of the regular meetings and future plans; most popular column lists equipment that is offered for sale or swap.

With the announcement of the current International Geophysical Year, the Society immediately laid plans for member participation. A special committee was formed to coordinate plans for tracking the American satellite and transmitting data to IGY headquarters. Many club members received valuable practice by tuning their sets to the beeps of the Russian Sputniks.

Code classes are held each day during the lunch period by Harrison's Amateur Radio Society, using RCA facilities and equipment. Evening classes are held once a week.

Vaudeville stars Jimmy Durante and Milton Berle reached new popularity heights on television.

# The Fabulous Infant

"Mister Television" reminisces with Dave Garoway in Berle's old NBC studio, 6B, on "Wide Wide World's" story of television's first ten years.

Highlight was kinescope recording of Maestro Arturo Toscanini in rare TV performance with NBC Symphony Orchestra in Beethoven's 5th Symphony.

NBC-TV's "Wide Wide World" marked a television milestone with "The Fabulous Infant" — the story of network television. It was the first time that the three major networks, NBC, CBS and ABC, had ever co-operated to provide historic program excerpts of the great moments of television's first ten years.

"Wide Wide World," which is sponsored by General Motors and supervised by executive producer Barry Wood, presented "The Fabulous Infant" on Sunday, November 10. The program, produced by Herbert Sussan, began with a series of highlights from TV's first decade, including:

President Truman addressing the opening of the Eightieth Congress.

Maestro Arturo Toscanini conducting the NBC Symphony Orchestra in Beethoven's Fifth Symphony.

Dave Garroway demonstrating sound effects on his old Chicago program "Garroway at Large,"

George Burns and Gracie Allen in a scene from their show, "Burns and Allen."

Gene Autry chasing a bandit across the prairie.

Anthony Eden addressing the Japanese Peace Treaty Conference in San Francisco.

The explosion of an atomic bomb at Yucca Flat, Nevada.

Bishop Fulton Sheen in a television talk on the evils of Communism.

Ozzie and Harriet Nelson in a scene with their two sons on "Ozzie and Harriet."

President Eisenhower at his first inauguration.

Sen. Joseph McCarthy and Joseph N. Welch in a clash at the Army-McCarthy hearings.

Fess Parker as Davy Crockett on "Disneyland."

Ernie Kovacs appeared on the program in a live telecast from Las Vegas and recalled his early days on TV and the "break" that brought him sudden fame.

"That's the incredible thing about television," he said. "It's happened before and it will go right on happening. A performer appears just once before a vast audience and, if he is accepted — zoom, up he goes!"

Dave Garroway, host of "Wide Wide World," reminisced about his first assignment in broadcasting — a job as a radio disk jockey in Honolulu. "In between records," he said, "I just rambled on about anything that came to my mind. . . . In TV, I keep on doing just about what I had done before — talking to people as though I knew them — only more so because you're even closer to a person when you're in his home and he can see you."

Milton Berle appeared on the program in a live telecast from his old studio at NBC in New York — studio 6B. "There's no such thing as one television audience," Berle said. "It's hundreds, thousands, of audiences who are watching at one time. A joke that's funny in New York could be a bomb someplace else. You play enough vaudeville, big towns, small towns, and you discover there are a lot of Americans in America.

"Vaudeville was a great teacher. On just one television performance you play to more people than all the audiences of your life. And everything you'd ever learned — playing split-weeks and one-night stands in Steubenville, Fargo, Oxnard, Worcester, Gloversville — came in handy."

To look at a major source of new television talent, the program switched to three local TV stations around the country and sampled their programs: stations WBZ-TV in Boston, KMTV in Omaha, and KYTV in Springfield, Mo.

For a glimpse at the world of television films, the program went to Hollywood and the studios of "Dragnet." Jack Webb, the series' actor-producer-director, told how he achieved a new kind of realism. "We didn't have money for sets. So we used the offices of the Los Angeles police department. . . . We didn't have money to hire Hollywood actors, so we used people from radio. They didn't look like actors. They looked like anybody — just as cops and crooks look no different from you or me."

The cameras also looked in on a rehearsal of NBC-TV's "NBC Matinee Theater," the series of "live" dramas colorcast on weekday afternoons. Executive producer Albert McCleery introduced "Matinee's" huge staff — three producers, three casting directors, six business managers, ten directors, five art directors and scores of artists, carpenters, technicians, cameramen and other specialists.

At NBC's "Color City" in Burbank, the cameras showed some of the facilities required for a TV production: scenery, machine shops, carpenter shops, props, costumes, dress-making rooms, control rooms, cameras, pianos, lights and special effects machines that manufacture bubbles, fog and snow.

To sum up the first ten years of network television, the program introduced two TV critics, Harriet Van Horne of the *New York World-Telegram and Sun* and Hal Humphrey of the *Mirror News* in Los Angeles, who listed some of the medium's failures and some of its achievements.

Then, to show what Dave Garroway called the "special impact" of a live telecast from the scene of an actual event, the program switched to Washington and the ceremonies marking the 182nd anniversary of the U. S. Marine Corps.

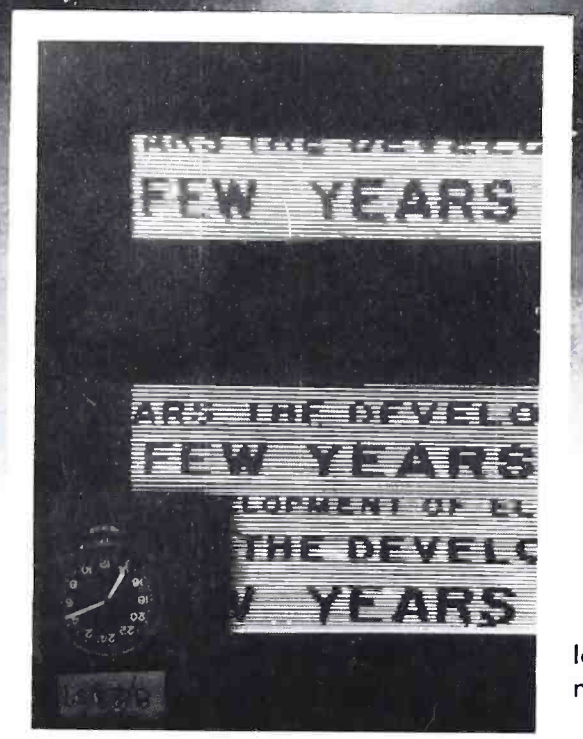
"The Fabulous Infant," according to a review of the program in the *New York Herald Tribune,* "was television's accolade to itself. All in all, it is a well-deserved one."

An early success on television, Dinah Shore is still a top performer.

Ernie Kovacs recalled "break" that brought him sudden TV fame.

Howdy Doody celebrated tenth birthday on TV during 1957. The major networks — NBC, CBS, ABC — cooperated to present TV's great moments of past ten years.

# Radio Via Meteor Trails




Ionized meteor trails, lasting but few seconds, are proving new means of transmitting high-frequency radio signals over long distances without the use of relays.

ELECTRONIC SCIENCE, one of the virtues of which is a remarkable ability to make orderly use of random effects, is turning to one of nature's most haphazard phenomena to achieve a new technique of radio communication.

The phenomenon is the apparently aimless but heavy bombardment of meteors penetrating the upper atmosphere 60 to 100 miles above the earth. The new technique is the bouncing of radio signals from trails of ionized air that linger briefly behind the plunging meteors before they are destroyed by friction.

RCA scientists, studying meteor path propagation of radio signals under an Air Force research contract, have recently employed meteor trails for the first time to transmit images of printed material over a distance of nearly 1,000 miles without relays. By means of experimental facsimile equipment developed at RCA Laboratories, high-frequency signals carrying the visual information have been bounced via meteor trail from the transmitting station of the National Bureau of Standards at Havana, Illinois, to the RCA Laboratories radio research installation at Riverhead, Long Island — an airline distance of 910 miles.

**Built-in Camera**

At the Riverhead receiver, the transmitted images have flashed briefly on the viewing screen as frequently as several times each minute during test transmissions, to be recorded each time by a camera built into the special receiving system. Each appearance of an image has signified the appearance along the transmission path of a meteor trail sufficiently long and persistent to reflect the signals downward toward the directive receiving antenna at Riverhead.

The experimental system, designed as a research tool for the investigation of meteor path propagation, was developed by RCA for the Cambridge, Mass., Research Center of the Air Research and Development Command. Principals in the development were Warren H. Bliss, of the technical staff at the David Sarnoff Research Center in Princeton, N. J., and R. J. Wagner, Jr., and G. S. Wickizer, of the RCA Laboratories radio research staff at Riverhead.

The scientists' explanation of the events involved in the system runs this way.

When a meteor enters the upper atmosphere, its high velocity causes the air particles to break down into

positive and negative ions. This trail of ionized air, which may persist for periods from one-tenth of a second up to several minutes after passage of the meteor, acts as a reflector of radio signals that would otherwise radiate out into space.

Meteors come in many sizes, leaving trails of varying lengths and persistence. The frequency with which useful trails may appear along any given transmission path is related to the amount of power employed for transmission and the bandwidth of the signal. Along the Havana-Riverhead path, employing a video bandwidth of 106 kilocycles, such trails may materialize from one to several times per minute to close the circuit.

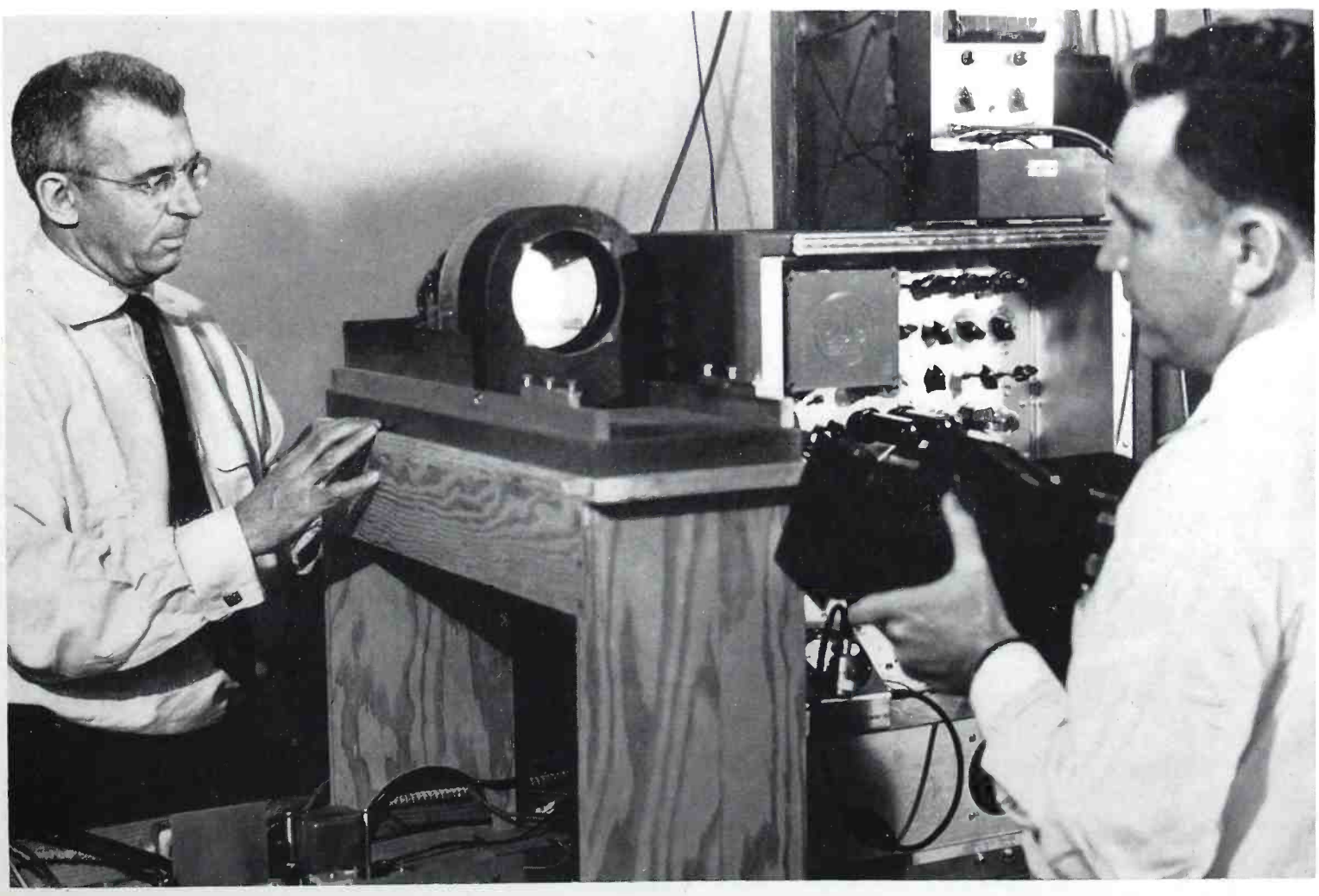
## Continuous Transmission

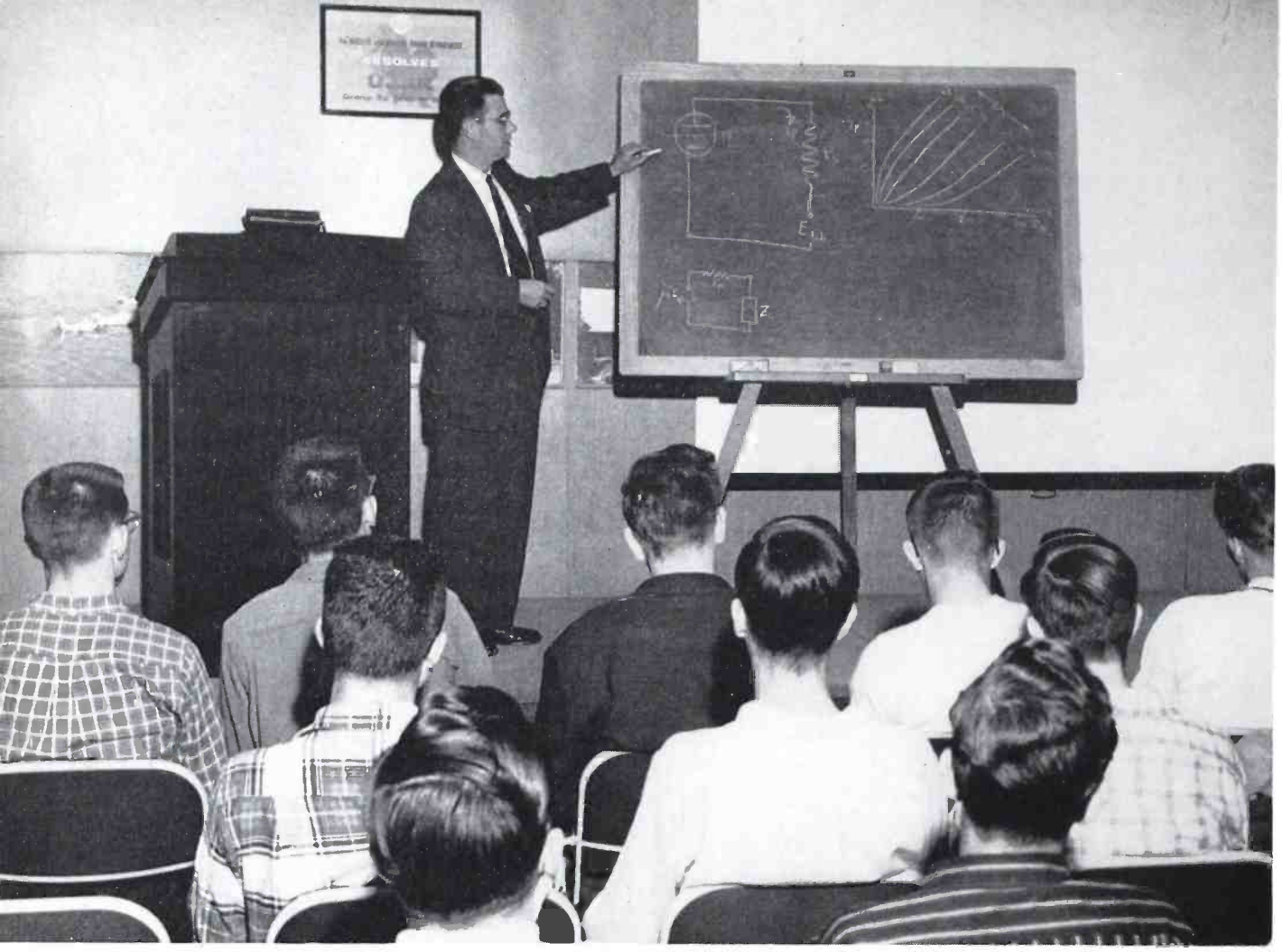
According to the RCA team, the experimental system transmits continuously, sending copies of a picture over and over at the rate of two complete scans each second. The receiver is also operated continuously, with the recording unit in a standby condition. When a passing meteor closes the transmission path, the incoming signal trips the recorder to permit reproduction of the image on the phosphor screen, where it is photographed automatically. The circuit then resets automatically for the next burst.

Basic research in the field of meteor trails has been conducted mainly under sponsorship of the Department of Defense, at Stanford University, the National Bureau of Standards and other facilities in the United States. In addition, similar work has been done in Canada and England, including the development by the Canadian Research Board of a teletype system employing this technique.

Both Air Force and RCA specialists have indicated that meteor path propagation promises ultimately to increase the versatility of radio communications by providing a means of sending information at times and over distances for which other means may not be available. According to a report by the RCA team, the optimum distance for transmission by this means is 600 to 1,200 miles.

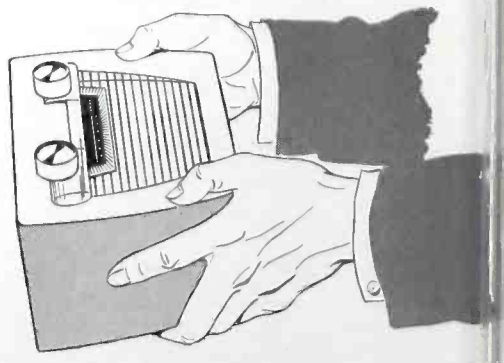
At the RCA receiving facilities at Riverhead, L. I., images from meteor trail transmissions flash briefly on a viewing screen; they are recorded by a fixed camera.





Courses for prospective student engineers are conducted for Moorestown, N. J., high school seniors by RCA engineers on voluntary basis.

# ELECTRONIC "DIPLOMAS"



THE high school senior bent over the half-completed transistor radio on the lab bench. He listened intently as the course instructor, an RCA engineer, went over his work and pointed out the good and bad points of his assembly technique. In other parts of the laboratory nineteen of the senior's classmates had identical radios in various stages of completion.

To carry home the coveted "diploma", awarded at the end of the course, each student had to assemble entirely on his own the radio receiver furnished him in kit form by RCA.

The "diploma" was to be the radio itself.

These twenty seniors were from the Moorestown, N. J., high school. They participated in the first of the orientation courses conducted by RCA in an experiment directed at attracting teenage students into the study of science and engineering.

RCA is in the forefront of industrial efforts to encourage greater numbers of teenage students to enter scientific careers. The program inaugurated last Spring by the Moorestown (N.J.) Engineering Plant of the RCA Missile and Surface Radar Department with this object in mind has shown particularly good results.

The Moorestown students were put through an intensive twelve-week orientation course by RCA electronic engineers to acquaint them with career possibilities in the expanding field of electronics engineering. At the end of this training period, the twenty youngsters were given the five-tube radio receivers they had constructed as part of their laboratory exercises during the course.

## RCA Engineers Volunteer

The one-night-a-week schedule was conducted by the RCA engineers on an entirely voluntary basis. The

program was arranged by Harry R. Wege, Manager, RCA Missile and Surface Radar Department, with the cooperation of Paul R. Jones, Superintendent of Moorestown Schools. Their express purpose was to provide senior students with a practical background for consideration of engineering as a profession.

Thomas G. Greene, an RCA Moorestown engineering leader in electronic development and design, served as class instructor. He was assisted by J. R. Schietinger and Earl R. Adams, of the Missile and Surface Radar Department.

Selected on the basis of achievement in science and physics and interest in electronics, the twenty seniors received definitive lectures on the various fields of engineering specialization; demonstration and lectures on the basic principles of electronics; and practical instruction in such laboratory techniques as wiring, crimping, soldering and the use and applications of test and measuring equipment.

The balance of the course was devoted to the construction by each student of a five-tube radio receiver, supplied in kit form by RCA. The radio assembly sessions were conducted under exact laboratory conditions and included technical discussions related to each major radio part and assembly.

The merits of such a program are being measured by its success in attracting students to the study of science and by its acceptance in the community. On both counts the Moorestown project has been outstanding.

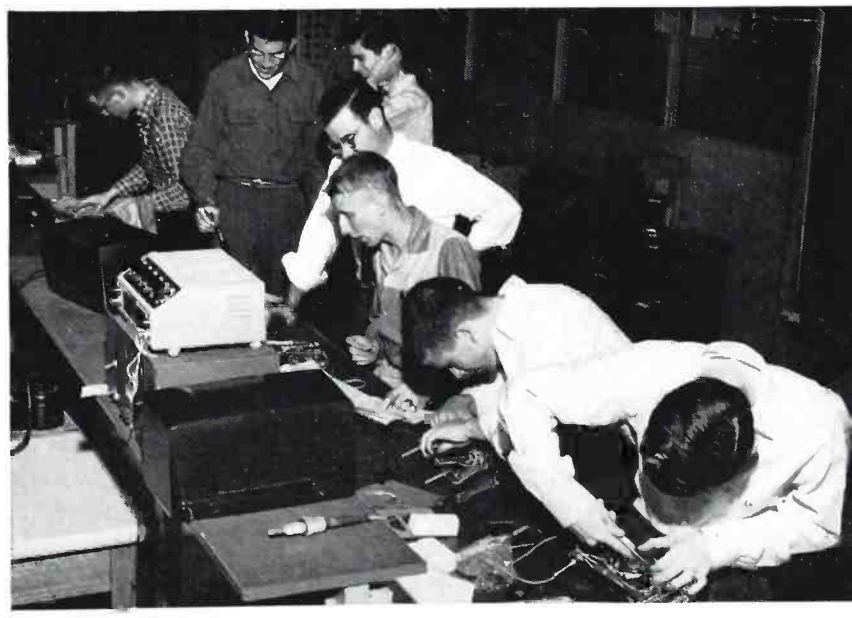
Thirteen of the twenty students who were in the first group have since gone on to college and are taking engineering courses.

## Community Appreciation

Superintendent Jones had this to say of the program: "RCA is to be congratulated for its pioneering effort in giving boys the opportunity to learn more about engineering from the practical standpoint. The program was a wonderful and enlightening experience for each of the boys and from discussing their future plans with each of them I know they learned a great deal. Their reaction to the course was highly favorable. We are deeply indebted to RCA for such a fine expression of cooperation with our schools."

The decision to continue the course for another year, and probably for as long as the engineering shortage exists, was made almost as soon as the 1957 class "graduated." The enthusiastic response on the part of the students made it obvious that RCA was fulfilling a tremendous need in the community.

From now until June, twenty to twenty-five of Moorestown's 1958 seniors will be eagerly probing the mysteries of radio and the basic principles of electronics, a vanguard of the much-needed engineers of the future.



Each of the twenty students was required to assemble radio receiver from kit furnished by RCA. So successful was the course that it is being continued this year on an expanded basis for twenty-five Moorestown seniors.

# Microwave Radio for Cuba

A NEW microwave radio system being engineered by the Radio Corporation of America for the government of Cuba is already speeding up the island's communications and promises further advantages for the Cuban economy. This was noted in a statement by P. B. Reed, Vice President, International Sales, RCA, following the recent inauguration of the first half of the system.

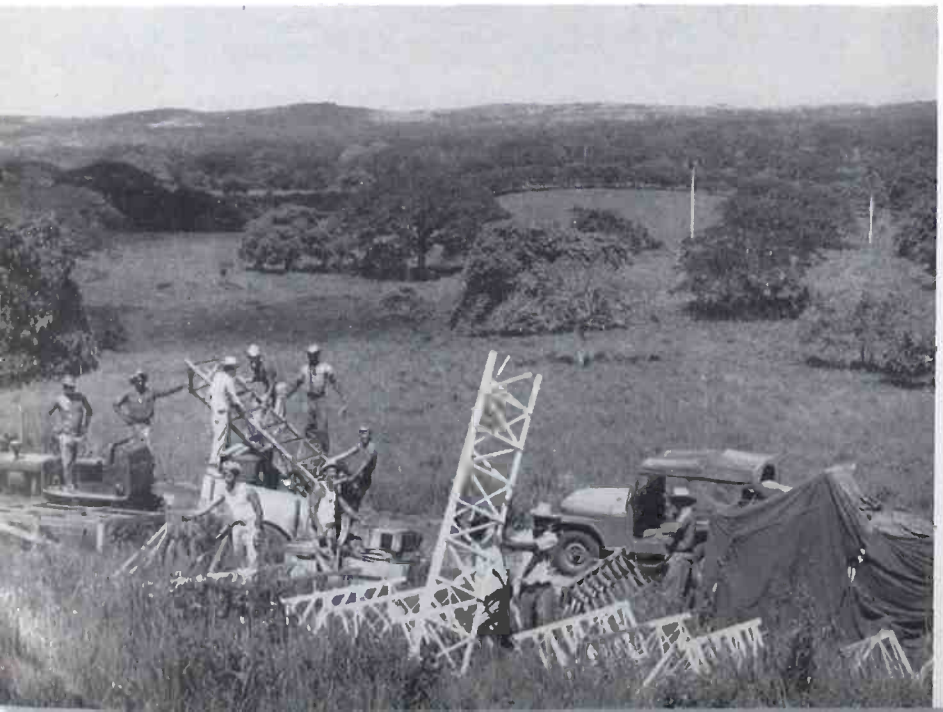
"With the extension of Cuba's modern communications system to Camaguey, approximately 50 per cent of the installation and construction work for the nationwide network is completed," said Mr. Reed. "The flow of communication has been speeded up. More volume of communication has also resulted. Far reaching economic benefits are foreseen.

"Since early 1956 when the first link out of Havana was put into operation, the system has provided new telephone and teletype facilities to many other cities throughout the country. It is expected that the entire system, stretching from the eastern to western tips of Cuba, will be completed by the end of 1958."

The backbone of the network consists of thirty microwave stations located along the center of the island. Of these stations twenty-three have been completed, while others are being installed and under construction. The main portion of the system will provide sixty-six telephone and ninety teletype circuits for public telegraph service as well as various branches of the government. These circuits total 30,000 miles.

Areas of the island not directly served by the main microwave trunk will be connected to it by branch circuits to 110 satellite stations. To date twenty-three of these stations have been completed, and thirty-five more are in various stages of construction. These satellite stations will also provide service with various types of mobile units.

Cuban labor constructed the microwave network under the technical supervision of RCA engineers.



## Private Lines Available

Some of the satellite stations will be used to extend the public teleprinter service for the Havana area and others will provide service in localities not served by the original system. Private "leased line" facilities will also be made available to sugar mills, and similar agricultural and industrial organizations. Mobile microwave units are included.

A vital role of the entire network will be the transmission of weather maps and data to the Cuban Naval Observatory in Havana which is participating in the U. S. Weather Bureau program to give improved hurricane warning service. All station buildings and antenna towers in the microwave system are designed to be hurricane proof.

Among the island's principal cities connected by the system, with direct telephone and telegraph service to the nation's capital, are Pinar del Rio, Havana, Matanzas, Santa Clara, Cienfuegos, Camaguey, Holguin, Santiago de Cuba and the U. S. Naval Base at Guantanamo.

The trunk system operates at a frequency of 2,000 megacycles while the satellite stations utilize 150 megacycle equipment.

Mr. Reed pointed out that construction of the network is being performed by Cuban personnel under the technical supervision of RCA engineers. RCA has organized a school to provide Cuban technicians with the specialized training for the installation, operation and maintenance of the system. Sixty-five men have already graduated from the school's intensive training course in electronic communications.

"The Cuban microwave network reflects the growing development of telecommunications throughout the world," Mr. Reed said. "RCA is engaged in similar engineering work in Colombia, Venezuela, the Dominican Republic and Pakistan."

Proper record care gives even better results on the RCA Victor Mark VI Orthophonic hi-fi "Victrola."

# 'CARE' and 'FEEDING' of Records

## *Advice from experts for record collectors*

RECORDS are thin, round, usually black plastic discs. As they are inanimate and silent, unless spinning, they are often neglected, mistreated and ignored. Records do not respond to this treatment kindly. They give their best performance when pampered and respectfully handled.

There are do's and don'ts of record care that can give the record owner greater satisfaction and longer play from his pets. Starting at the dealer's where you buy your record, it is advisable *not* to play the record there. This will prevent scratching by a bad stylus. Nowadays records come with an inner sleeve to protect them and it's a good idea to keep them encased in this inside their jackets.

When a record is removed from its case, it should be handled only on the outer edge. If oil or dirt on the hands gets on a record it will attract and collect dust which acts as an abrasive that the stylus grinds into the record's grooves.

Before playing a record, it is advisable to dampen a lint-free cloth in water, or an anti-static solution and pass it lightly over the record's surface. This will insure its being dirt free before you play it. Cool moisture doesn't hurt records but any liquid solvent is harmful, such as alcohol, benzine, acetone or cleaning fluids.

Over the years, the vinyl material of which records are made has been improved and toughened to resist damage, but they do have a breaking point, melting point, and most of all, a scratching point. Human finger nails are harder than records.

An ingredient called "coldflow" is a property of all plastics which causes them to "droop" with an increase in temperature. Records should be kept away from radiators, heaters, fire places and other excessively warm places. Another characteristic of plastic is that it has "memory," which means that it tends to revert to its original state when over-heated. One hundred twenty degrees is the warping point. On the other hand, extreme cold makes records more brittle.

The weight of your tone arm is critical. Excessive weight can cause wear. And the stylus should always be in good condition. A worn or chipped needle can cause scratching, skipping and excessive wear. It is wise to remember that a diamond stylus can give 400 to 500 hours of play, a sapphire stylus about forty to fifty, and a steel tip lasts four to five hours. The damage done by worn-out styli cannot be repaired.

In turning a record over, it should be flipped by holding on to its outer edges. Groove guard records do not actually touch each other during play except at the labels. The groove guard protects surfaces by a slight recessing between the bead at the outer edge and the label in the center. About 50% of records made today are groove guard.

A warped record can make those on top of it sound "off." Make sure that warped records are not played with others. To keep your records from warping, it is wise to stack them on end rather than flat, even though their stiff jackets are designed to keep them from warping.

It doesn't usually injure records to play them on old equipment, but remember that the tone arm is heavier on old equipment, which usually doesn't have a diamond stylus and whose sound could be inferior.

Well cared-for records can give years of satisfying play and make fine flying saucers for the kids when usefulness is over.

# Tomorrow's Customers

## Schoolchildren visit RCA's Hall of Progress

A GROUP of high school students filed quietly into the thickly-carpeted room, looked with interest at exhibits lining the walls, then took their seats, like a class preparing to hear a teacher talk about geometry, history or English.

But this was different. It was a typical field trip visit to the RCA Hall of Progress at Cherry Hill, N. J. This class had traveled some nineteen miles by bus, crossing the Delaware River from Pennsylvania to New Jersey in the process.

Students, from sixth graders through high school age, are among the best customers at the Hall of Progress, which highlights the history of radio, television and recorded sound from the earliest days.

An open invitation is out to school classes from practically anywhere within traveling distance to visit the unique museum on Route 38, some six miles east of Camden.

The young visitors come from as far away as Reading, Pennsylvania, a trip of well over 100 miles.

To date, thousands of school children have trooped into the museum, ogled in disbelief at the early, primitive-appearing phonographs, expressed delight over hearing a playback of their recorded voices, and clamored to see color television.

### Word-of-Mouth Publicity

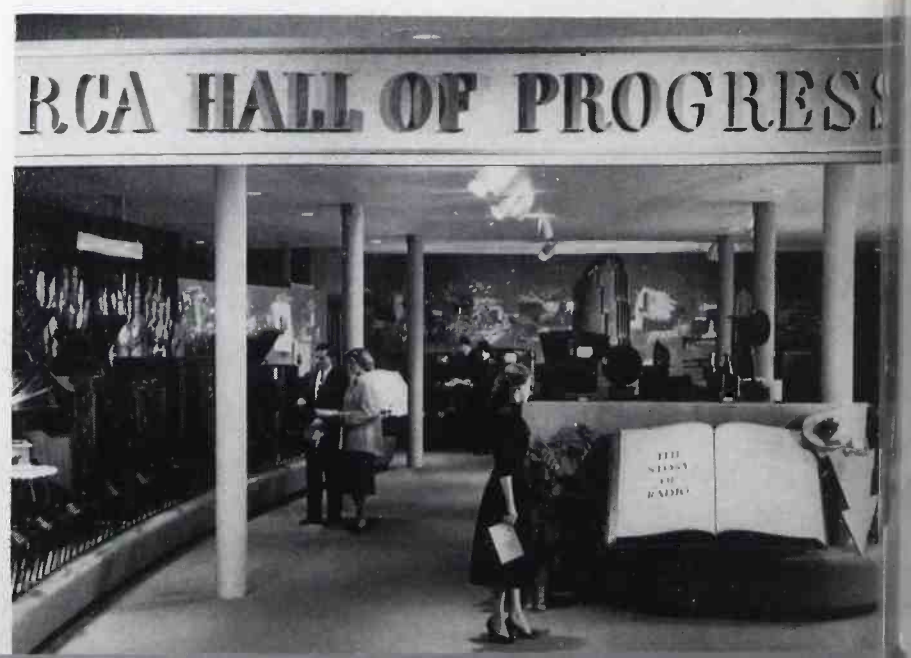
Each trip has its beginning when Emil A. Dodelin, RCA Hall of Progress Manager, receives a telephone call or letter from an interested school teacher. The teacher may have learned of the Hall of Progress through promotional channels, or, as is often the case, via word-of-mouth — for RCA strives hard to make each visit a memorable one.

A future date is set for the class trip, and if the youngsters have an unusually long jaunt, arrangements are made for them to eat in the company cafeteria.

The class is greeted at the front door and escorted into the Hall of Progress (just off the main lobby) where Mr. Dodelin and Fred K. Homer, Assistant Manager, take over.

Seats are provided at one side of the museum for a short, interesting lecture — illustrated with actual RCA products.

Mr. Dodelin usually starts his talk with a brief background of RCA history, and a reference to the famous 1916 memo regarding a "radio music box," as the key to radio broadcasting. The memo was written by a young radiotelegraph official, David Sarnoff, now Chairman of the Board of RCA.




Display contains David Sarnoff's 1916 memorandum on the "radio music box" — the key to radio broadcasting.

Highlight of the tour for all student groups comes when they are allowed to record their own school song.

Students find early radios and phonographs fascinating, are always impressed when old models actually work.

Then, Mr. Dodelin will point out an early "Victrola" phonograph exhibit in the museum — such as the "trade mark" model — and explain its development and eventual evolution to the next, improved model.

### History of Radio, TV

Following the phonograph story, the lecture usually swings back into the history of radio, and winds up with television. Commercial and defense electronic products, records and electron tubes are also mentioned.

Mr. Dodelin effectively illustrates the vast improvements in recording by playing a record on an early "Victrola" phonograph, then playing the same record on a new Orthophonic high fidelity model.

He does the same in radio and television, and actually switches on these sets to prove that they still play — although many are anywhere from 10 to 40 years old.

The evolution of radio, TV, phonograph and records is pointed up by these displays, chronologically set up along the walls in specially built cases.

All the historical sets are in operating condition, and never fail to impress visitors when they play at the flick of a switch.

"Many pupils, who are too young to remember pre-television days, absorb quite a bit from our demonstrations," says Julius Haber, Director of Community Relations, who has over-all responsibility for RCA's permanent exhibits.

"Our exhibits, lectures and demonstrations at the Hall of Progress give a quick — but basic — course in the history of the radio, phonograph and television fields — a story that RCA Victor is uniquely fitted to tell because of its pioneering leadership in all three fields.

"These young visitors of today will be our customers of tomorrow and I can think of no better way to build future RCA customers."

Many of the hundreds of persons who visit the Company's Cherry Hill facilities daily take time to step into the Hall and "browse around" — looking at color television in operation, listening to a demonstration of RCA's new "Stereophonic Sound," or just looking at some of the older sets that stir memories.

### Recording School Song

Following the lecture and demonstration the high point of the visit — as far as many of the students are concerned — is reached. They record their school song or individual voices on an RCA tape recorder, and the results are immediately played back amid reactions of delight and embarrassment.

If color is being telecast at the time of the visit, the RCA color set is turned on and the visitors get a chance to see RCA Victor Big Color TV — many for the first time.

"We know from past experience that the favorable impression which RCA and RCA Victor products and services make on school children often has a lasting effect in terms of future customers," says Emil Dodelin.

"We try to generate that kind of an impression at the Hall of Progress."

# RCA . . .
# Good Neighbor

Ewen C. Anderson, Exec. Vice President, Public Relations, accepts award for RCA's community service from South Jersey Public Relations Assn.

THE Radio Corporation of America is "one of the neighbors" in nearly three hundred communities throughout the United States.

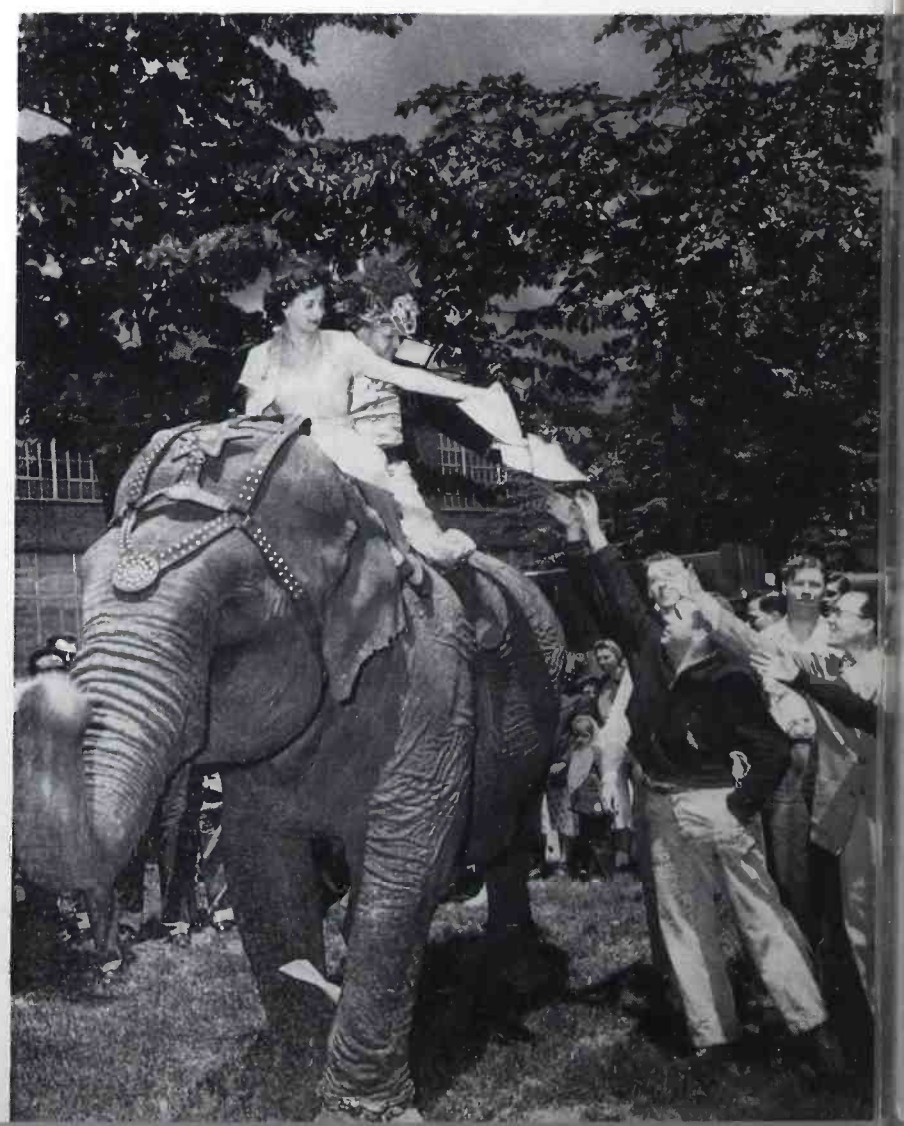
That is the number of locations in which RCA operates—factories, laboratories, offices, warhouses, broadcast and communications stations, service branches. All of these units have established some kind of friendly working relationship with the communities in which they operate, as a company and as individuals.

Community participation requires the donation of time and money to many causes. RCA has supported and contributed to every worthwhile cause with which its employees have come in contact. Community Chests, local and national charities, blood banks, savings bond programs, disaster relief, medical and health needs, youth programs, these are only a few of the different kinds of community participation to which RCA and its individual employees contribute.

Donations to funds and charities are made as a matter of company policy, taking into consideration the size of a given plant, number of employees, budgetary needs of the agency, and the recommendations of local

Nicholas J. Cappello, Personnel Manager, Defense Electronic Products, visits agency in Camden, N. J., providing care for neglected children.

Camden Plant employees are given applications for savings bond purchase by volunteers riding an elephant.



RCA executives. And, these donations are substantial ones. For instance, one such gift, to the Bloomington, Ind., United Fund amounted to $15,000.

Employee contributions give much needed support to hospital drives in particular. One such campaign in Camden, which oversubscribed its goal of $6,600,000, was sparked by RCA employees from the initial planning phase. A similar effort in Indianapolis, where Company and employees gave of their money and time, raised $12 million for a five-hospital United Building Fund.

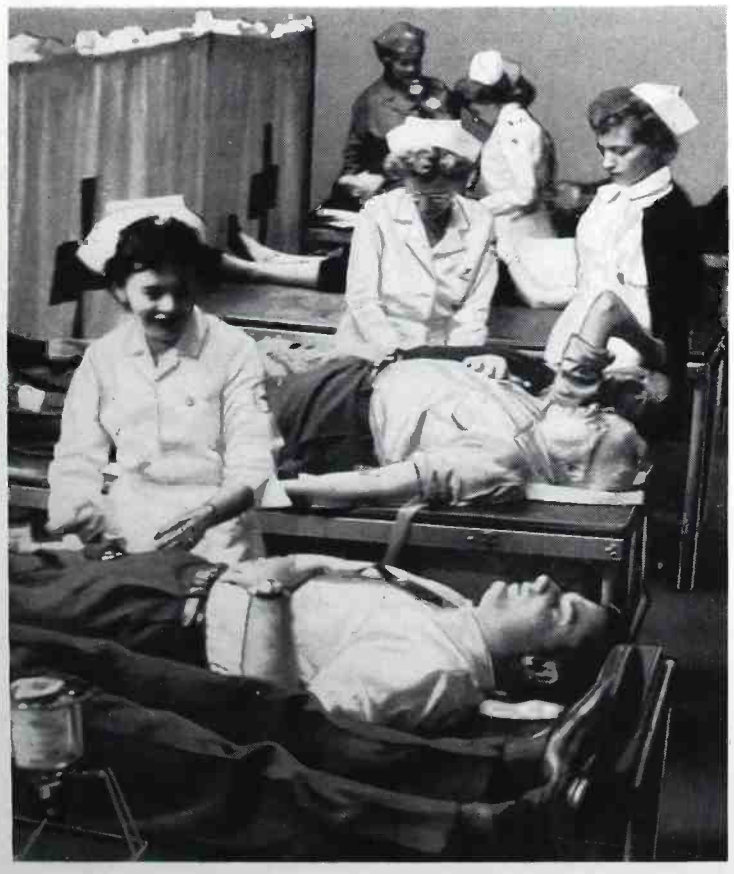
RCA volunteers sponsor youth activities at many Company locations. Employees act as advisers in Junior Achievement groups, which help young people learn the elements of business organization and operations. At the Moorestown plant (see story on page 20) RCA engineers gave a 12-week course for 20 high school students to acquaint them with engineering as a profession. Hundreds of classes from grade school through college level are regularly conducted on tours of the RCA Exhibition Hall in New York, the Hall of Progress in Cherry Hill and the Company's permanent exhibit at the Museum of Science and Industry at Chicago.

Last year the South Jersey Public Relations Association Annual Award for Community Service was presented to RCA "in acknowledgement of its outstanding corporate good citizenship." In accepting the award, Ewen C. Anderson, Executive Vice President, Public Relations, said that the company's overall objective is to help make each community in which it operates a better place to live and work.

"We regard our corporate duties and responsibilities," he said, "as being the same as those of the individual citizen — to contribute to the community's progress, as well as to benefit from it.

"A Company such as ours seeks to carry out its civic responsibilities in two major ways. First, the Company assumes a fair share of the contributions to the financial support of worthwhile community projects. Second, the Company encourages its people to participate with their talents, their experience, their time and their own money in support of progressive community endeavors."

Over 300 RCA-NBC employees have won Red Cross commendations for donations to the New York area blood bank.



JARCA Junior Achievement girls selling their products in the Harrison, N. J., Plant cafeteria.

Boy Scouts hoisting flag during one of their frequent camporees on the grounds of the David Sarnoff Research Center in Princeton, N. J.

# George Gobel

## PRIZE FOR A DAY

GEORGE GOBEL himself was given away as a first prize in a national television contest. His sponsors, Radio Corporation of America and Whirlpool Corp., gave the diminutive monologue specialist as a prize for a day to the winner of a contest aired on "The George Gobel Show" and on the NBC network show, "Today", conducted by Dave Garroway.

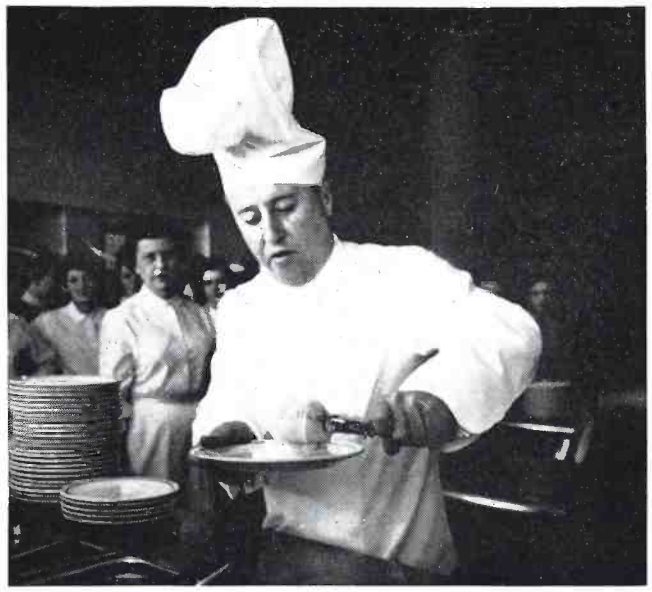
Mrs. Fred J. Schneider, wife of a referee in Cincinnati's Probation Court won Gobel for the city of Cincinnati and for twenty-four hours on November 20-21 Gobel was at the disposal of the citizens of the Queen City, body, talent and all.

"I don't know what the people of Cincinnati will ask of me," said Gobel, "but, if they want me to shinny up a greased flagpole or milk a purple cow, I'll do it. I'm a prize — and prizes don't talk back."

Arriving at the Greater Cincinnati airport Gobel was met by high school bands, majorettes and cheerleaders,

Gobel was met at the Cincinnati airport by an Air Force guard of honor and high school drum majorettes.

At St. Aloysius Orphanage, Gobel received an orchid from a four-year-old, sang, danced, played checkers — and left behind a portable RCA Victor television set.



On Ruth Lyons' WLW "50-50 Club" show, Gobel presented Ohio's governor fruit from governor of California; at Central High School he served in cafeteria line and was later made honorary fireman.

an honor guard platoon of Air Force sergeants, a Mayor's Committee, the city's three television editors, who acted as co-hosts for Gobel, and representatives of television, radio, newspapers, and *TV Guide*. Colonel Woods Rogers, USAF, presented Gobel with a U. S. Certificate of Appreciation for his work in connection with Air Force recruiting. Prize-winning Mrs. Schneider officially turned Gobel over to the City of Cincinnati.

Gobel's Cincinnati Day began the following morning. He donned RCA Service Company coveralls and personally delivered Mrs. Schneider's real prizes, an RCA Victor "Aldrich" color TV set and an RCA Whirlpool freezer, to her home. Wittekind Terrace, the street of her residence, was changed to Gobel Terrace for the day.

At Central High School, an honor guard of twenty strutting majorettes escorted Gobel into the cafeteria where he served lunch to the students until someone produced a guitar. That ended lunch.

On leaving, enroute to Station WLW, the majorettes bodily carried him outside to a waiting cavalcade of limousines. On Ruth Lyon's "50-50 Club" show, broadcast over WLW to Cincinnati, Columbus, Dayton and Indianapolis, Gobel presented Gov. C. William O'Neill of Ohio a goodwill basket of fruit from Gov. Goodwin Knight of California.

At the St. Aloysius Orphanage he entertained a couple of hundred children who had been assembled from various Catholic orphanages throughout city.

At the Cincinnati Fire Department Chief Dan Vogel made him an honorary Fire Chief for the day.

In a borrowed fire engine, Honorary Chief Gobel and Chief Vogel rode to downtown Fountain Square where Gobel turned policeman. After tying up the evening rush hour traffic in sixty seconds flat, Gobel left to attend a March of Dimes meeting. There he urged workers to support the "Mothers' March" next January.

The promotion department at Kenyon and Eckhardt advertising agency arranged the tour.

He donned RCA service uniform to deliver color TV set to home of real prize winner.

As honorary traffic cop Gobel tied up evening rush hour traffic in sixty seconds flat.

# STUDIO: THE WORLD

*(Continued from page 9)*

these optical techniques to be transferred by electronic means into television.

The "Chroma-Key" process, or colormatte as it is sometimes called, enables television to:

- project live action against any background (film, slide shots or even live), no matter where located.
- use representational or non-representational, fixed or mobile backgrounds.
- use elaborate and distant scenes or structures to be shown as backgrounds at limited cost.

Heretofore, television has had many of the same limitations as the stage in presenting plays and other dramatic offerings. Only elaborate and expensive productions could afford more than two or three sets at most. The perfection of the "Chroma-Key" process promises to free television from these limitations to a great extent, permitting the same wide range of settings that are enjoyed by movie makers.

The technical difficulties have been largely overcome, but many technicians, directors, producers and lighting experts will have to gain experience and training in the use of these techniques before the full potentialities of "Chroma-Key" can be realized. It does not of course, mean the end of stage settings for television plays. Many stationary settings, particularly interiors, will still be used. But the writer and the director are no longer arbitrarily restricted to one or two locales.

A story can begin, say, in a New York apartment, which will be presented in an ordinary stage setting. If the script calls for the next sequence at the top of the Eiffel Tower in Paris, this scene can be introduced by "Chroma-Key" using either slides or stock film shots. Other sequences of the story can take place on a transatlantic liner, on top of a peak in the Alps, or at the rim of the Grand Canyon, all inserted into the telecast by "Chroma-Key" with no break in the continuity.

The method literally puts the world at the disposal of the writer and the director. Studios will suddenly find new uses for their libraries of stock film shots, slides, paintings and photographs from all corners of the globe. Scenes from the jungle, the veldt, the steppes, south seas islands, cities, villages, shrines are ready for instant use in these libraries.

Economically, "Chroma-Key" will effect tremendous savings by the elimination of individual scene paintings and in set construction. Rather than having an artist paint a forest or jungle scene for a safari story, the actors can be inserted into a film clip of the actual jungle with live lions moving about.

The use of "Chroma-Key" will, on the other hand, make even greater demands on the dramatic talents of actors and actresses. It is one thing to project an emotional mood in a simulated "actual" setting, say, the mood of reverence in an elaborate cathedral setting. It is quite another to put across the same feeling when acting on a bare stage.

# Film TV Portrait of Rome

DOCUMENTING a great city on film is a tremendous undertaking. And, when the city is Rome, with all of its officially protected art treasures and ruins, the preliminary red tape involved in getting permission to film sacred and historic sites can be discouraging.

Overcoming such obstacles became routine for the NBC-TV production unit that filmed the four-part series "Rome Eternal," being shown this month on "The Catholic Hour."

Headed by NBC producer Doris Ann and director Martin Hoade, of the National Association of Catholic Men, the unit spent over six weeks committing the glories of Rome, the "Eternal City" to film.

The series, largest single project ever undertaken by "The Catholic Hour," presents Vatican art treasures, recent excavations under St. Peter's Basilica, Christian art of the Renaissance, and historic sites famous in the early history of the church.

The last program in the series features an audience with the Pope himself, with glimpses of the Pontiff's private apartments, the Vatican post office, radio station and mosaic factory.

NBC-TV production unit spent six weeks filming a four part series on Rome for "The Catholic Hour."

# *Surveying Color TV Trends*

WHAT kind of people are the first to buy color television receivers? . . . What effect does color have on viewing habits? . . . What can color TV offer to advertisers? . . .

For answers to these and related questions, the television industry and the advertising profession are keeping a close watch on "Colortown," a major survey underwritten by the National Broadcasting Company and Batten, Barton, Durstine and Osborne, one of the nation's leading advertising agencies.

Colortown is a typical medium-sized American community selected for study as a living laboratory. A panel of 4,000 homes has been selected, and these homes are periodically re-contacted in order to trace the pattern of color television's growth.

## Evaluating Color Potential

The survey is designed to evaluate the potential of color television both as a mass medium which will soon be reaching millions of homes, and as an advertising vehicle offering unique advantages.

Already accepted is the concept that color television is the most complete advertising medium — combining sight, sound, movement, demonstration and color. One of the objectives of the Colortown project, was to measure this power through statistical methods.

An interim report, recently released, sums up findings to date. While color circulation in the selected city is still relatively low, several significant trends have emerged as a result of the study.

## Findings To Date

*Who owns color sets?* Present color owners earn more, live better. Seven times as many color owners as black-and-white owners fall in the high-income groups. One quarter more own their own homes.

Color owners are more influential, more active in the community. They belong to more church organizations, more social clubs, do more fund-raising, take part in more civic and business associations.

*Are owners satisfied with color TV?* A total of 91 per cent of all owners were satisfied with the performance and effectiveness of their sets. Of this group, 54 per cent said their sets were actually performing better than they had expected. Less than 3 per cent said they were dissatisfied because of too many service calls.

Of the group interviewed, 83 per cent reported they had recommended the purchase of color receivers to their friends.

*How does color affect viewing?* Color doubles the audience for TV programs on a per-100-homes basis. More color homes watch the shows, and there are more viewers per set. Color appears to induce increased viewing among a group which ordinarily views at a less-than-average rate.

Color owners will watch a program in color when they would not care for the same program in black-and-white.

*How effective is color for advertisers?* Color was found to provide a tremendous boost in the effectiveness of TV commercials. As an indication of this effectiveness, respondents said they were "more inclined to buy the product" when they saw it in a color commercial. This "inclination to buy" was two-thirds higher than among monochrome viewers.

As another indication, both color and black-and-white viewers were asked to name — unaided — the products advertised on color shows they had seen a week earlier. The number of products named per 100 homes was almost four times as great in color homes.

*Why did owners buy color sets?* More than half the color owners said they had purchased the sets because they had seen one or more programs in color and were impressed.

*Who enjoys color television most?* While reaction was favorable at all income levels, it was found that the lower the bracket, the more enjoyable color was found to be. Highest interest was in the under-$5,000 income group.

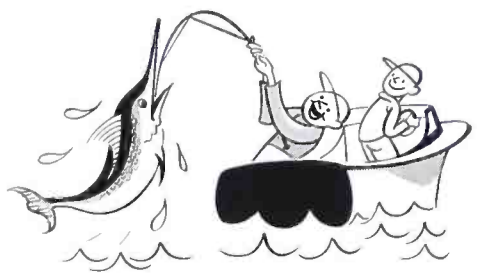
# Briefly Told . .

*Vice Presidential Commendation*

A personal commendation from Vice President Richard Nixon greeted Tony Scott, jazz clarinetist, on his return from his recent tour through Europe and Africa. Scott, who records exclusively for RCA Victor, spent eight months on a personal goodwill tour, in which he not only gave concerts but played American music with musicians from abroad.

"I am sure that you had many memorable experiences while you were visiting the different countries," Mr. Nixon said in the commendation, "and that you were able, through the medium of music — when language was a barrier — to create among the musicians with whom you met, as well as your audiences, a feeling of friendship for our country."

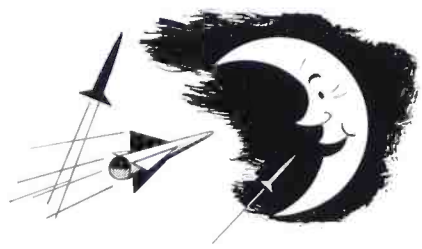
Tony Scott's most recent record release, the Complete Tony Scott, is one of RCA Victor's best sellers in the jazz field.



*"Radiomarine" Gear . . .*

Anglers can have their fish-finding work done for them by new equipment being shown by RCA this month at the 48th Annual National Motor Boat Show in New York's Coliseum. Electronic navigation, communications and fish-finding gear for pleasure craft and small commercial vessels are being demonstrated at the Show by RCA "Radiomarine" Sales.

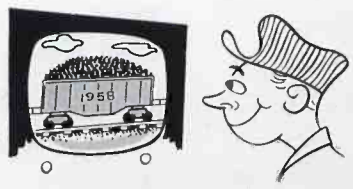
The "Lodar" system for small craft provides both horizontal and vertical scan of ocean depths for fish-finding and depth-sounding. A new navigation radar system gives maximum clarity in short ranges of one to four miles and long ranges of twelve to thirty-two miles. The system can, in addition, detect objects within twenty yards of the vessel. The "miniskop," fish finder features a shallow-water range from zero to sixteen feet, as well as ranges up to 500 feet deep. A 15-watt radiotelephone is designed for ship-to-shore and ship-to-ship service; it provides twenty channels of operation.



*Global Sales . . .*

"Shoot for the Moon" was the theme of the RCA International Sales convention held in New York from November 17 to 23. In an atmosphere that was liberally sprinkled with "launching platforms," "guided missiles," and "space ships," Regional Managers and Field Representatives from all over the world sat in on a discussion of RCA's plans to reach new heights in customer benefits, profits and services for 1958.

Held under the direction of Michael F. Dowley, Jr., Director, Export Operations, RCA International Sales, the convention held sessions at the Warwick Hotel in New York, the offices of RCA Victor in Cherry Hill, N. J., and the Distribution Center of RCA International in Clark, N. J.




*Railway TV Network . . .*

An RCA closed-circuit TV network now keeps tabs on all freight operations in the Southern Railway's new $20 million yard in Atlanta, Georgia.

Latest advance in RCA video tape for color is examined by Theodore A. Smith, right, Executive Vice President, and George H. Brown, Chief Engineer, of RCA Industrial Electronic Products.

A clerk at a master console can "see" and identify all freight cars rolling into the yards on six inbound tracks over distances of more than two miles. The nation's largest industrial television system for automatizing complex railroad freight operations, the network consists of ten TV cameras. Each camera is paired with a standby unit than can be switched automatically into emergency service.

*Era of TV Tape . . .*

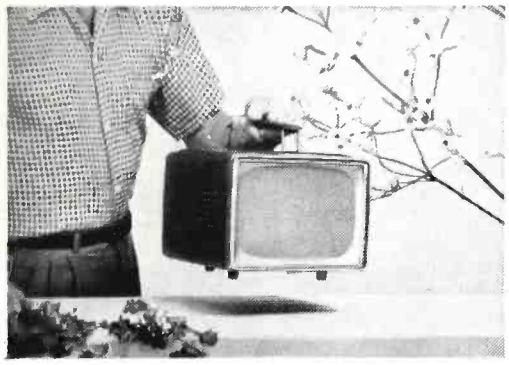
The era of magnetic tape television — both in color and black-and-white — will be launched this Spring by NBC.

Robert W. Sarnoff, President, made the announcement on November 4 at a press demonstration of RCA video tape at NBC's Color City studios in Burbank, California, attended by more than 100 television editors from all over the country.

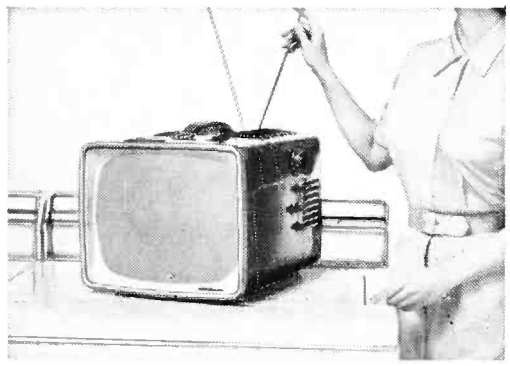
Mr. Sarnoff said that by means of magnetic tape recordings, color TV programs will be made available on regular time schedules throughout the country. This will be accomplished through the construction of a new $1,500,000 video tape central in Burbank, and a similar tape central at Radio City, New York.

Introduction of magnetic tape will end scheduling problems and confusion caused by time zone differentials.

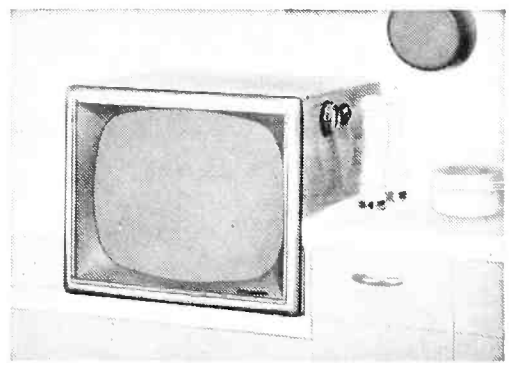
# You name the place—any place in your home
# RCA Victor has the TV to fit it—perfectly!



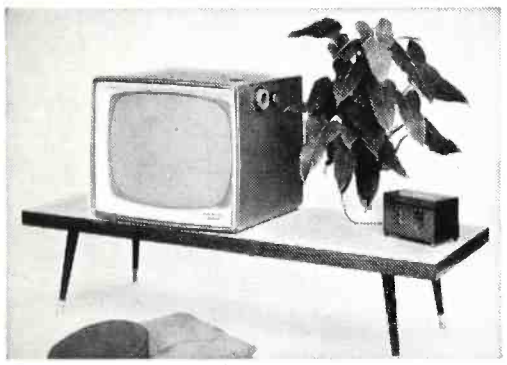
**Puts the show on the patio**—or any place else you like. Smallest, smartest TV of all with sharp 36 sq. in.* picture, handle, antenna connection. "*Personal.*" Ebony. (8PT701) $99.95.



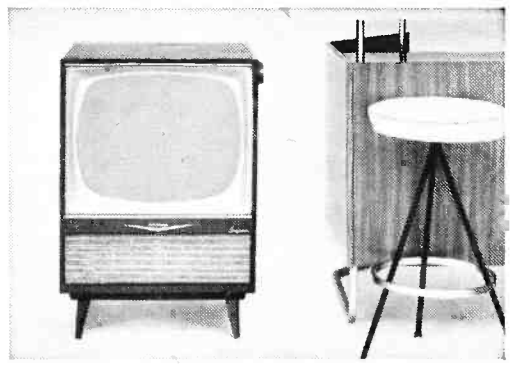
**Makes light of the laundry!** Pleasure is as automatic as the washer with this compact, easy-to-carry portable. "Living Image" 108 sq. in.* picture. *Wayfarer.* Red. (14S707) $149.95.



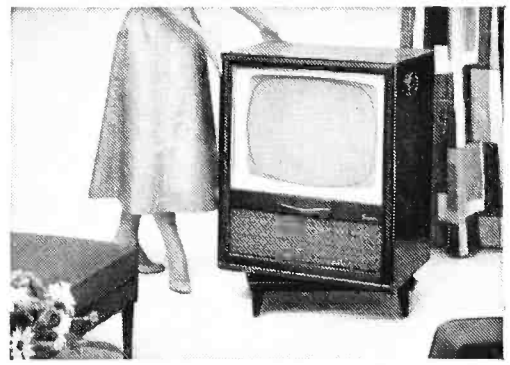
**Serves you in the kitchen**—with easy lookin' while you're cookin'. In good taste on any table. 261 sq. in.* screen. *Dixon.* Limed oak grained finish. (21T715) $229.95. Other finishes $219.95.



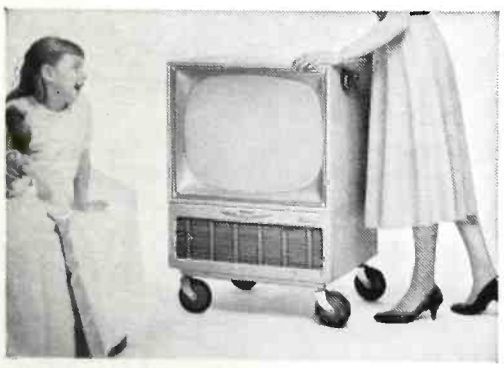
**Saves space in small apartments**—in a big way. This sleek Deluxe table model is ideal—makes any room roomier. 261 sq. in.* picture, many extras. *Bailey.* Tawny gold. (21D717) $239.95.



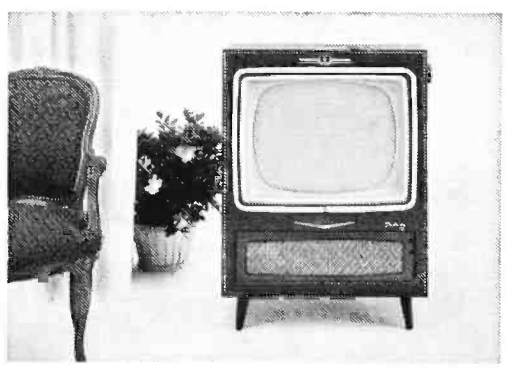
**Sits pretty in the playroom,** fits in with the fun perfectly. Terrific value in console styling. 261 sq. in.* picture. Balanced Fidelity Sound. *Eaton.* Mahogany grained finish (21T735) $249.95.



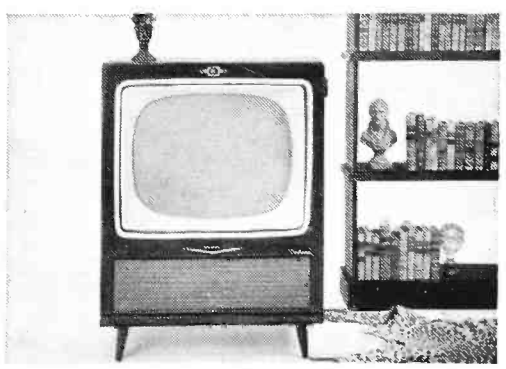
**Aims to please—anywhere.** Swivel TV makes every seat front row center. Phono-jack for record player. Balanced Fidelity Sound, 261 sq. in.* picture. *Enfield.* Mahogany grained finish. (21T738) $299.95.



**Rolls entertainment into the sickroom.** Good medicine on rubber-tired wheels! Deluxe sound, tuning and 329 sq. in.* picture. *Oakmont.* Limed oak grained finish. (24D729) $299.95.



**Goes formal in your living room.** Handsome is and handsome does this Deluxe TV with 3-speaker Panoramic Sound and 261 sq. in.* picture. *Whitman.* Mahogany grained finish. (21D744) $349.95.



**Puts a man-size picture in your den.** You'll get the picture bigger-than-life (329 sq. in.*) and superlative 3-speaker sound, too! *Ellsworth.* Mahogany grained finish. (24D754) $369.50.

*See black-and-white TV from $99.95 and Big Color TV from $495 at your RCA Victor dealer's*

RCA VICTOR
Tmk(s)® RADIO CORPORATION OF AMERICA

Manufacturer's nationally advertised VHF list prices shown. Prices and specifications subject to change. UHF optional, extra (not available on "*Personal*"). Some sets slightly higher far West and South. Most models available in Canada.
**At your service:** RCA Victor Factory Service Contracts available in most areas but only to RCA Victor owners. Special low-cost 1-year contract on "*Personal*" or portable—only $14.95.

| *Square inches of viewable picture area | 36 | 108 | 261 | 329 |
|---|---|---|---|---|
| Picture tube, overall diagonal | 8" | 14" | 21" | 24" |

# Every 3 seconds!

Every three seconds, an RCA Factory Service Technician performs a service call somewhere in the United States!

That means, in the time it takes you to read this ad—approximately 45 seconds—15 contacts were made all over the country. Fifteen RCA Victor TV owners have taken advantage of their exclusive opportunity to call RCA's own technicians for service!

As the sole RCA consumer-contact, the factory technician is truly a "goodwill ambassador" for RCA products.

He specializes on RCA Victor television, uses RCA parts exclusively, and works out of the friendly neighborhood branch of RCA Factory Service.

No wonder so many customers count on him for technical advice, especially on color TV! No wonder he lays the groundwork for RCA Victor "Living Color" sales!

Yes, it happens every three seconds—RCA Factory Service Technicians make contacts that create color-conscious customers!

**RCA SERVICE COMPANY**

A DIVISION OF RADIO CORPORATION OF AMERICA

CAMDEN 8, NEW JERSEY